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ABSTRACT

This project proposal outlines a pilot project for meeting the educational goal that each individual shall acquire knowledge and appreciation of the environment and recognize personal responsibility for its quality. The project proposes to analyze the role of socio-technological change and problem-solving capabilities, and to compile and analyze data relative to regional environmental education needs. The project proposes to address needs by developing and conducting inservice activities, providing supervisory assistance and promotional activities, and evaluating the effectiveness of the project. (Author/RE)

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ED178352

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
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SE 029 289

INSTITUTION:	West Virginia Department of Education Bureau of Learning Systems 1900 Washington Street, East Charleston, West Virginia 25305
TITLE:	Personnel Development: A Model for Integrating Formal Non-Formal Environmental Education Resources Into Curriculum for Grades 4-8
GRANT NUMBER:	G007701355
PROJECT NUMBER:	522AH70374
USOE PROJECT OFFICER:	Walter Bogan
PROJECT DIRECTOR:	Robert Seymour
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OVERVIEW

The "IT" project attacked the idea of developing more Environmental Education or interjecting this or that Environmental Education upon available audiences. "IT" wanted to find out if it was not more realistic to survey all audiences and then go to the aid of those with the greatest needs. And go to them with resources geared to their needs.

> Do not tell the people who are starving because they have no flour for bread to go bake cakes and eat!

The scope of this enthusiastic project was so great that it needed to be well on its way prior to the beginning of school. But funding was late which meant staffing even later. And the funding that was granted was much below that needed for the proposed research and evaluation effort. This required additional delays to identify and pull back to the essential points. The surveys which remained essential were not completed until mid winter which left very little time to devise the sessions, inservice the teachers and check the results of resultant instruction.

Real learning takes time. But we only had two weeks of instructional time to try and see if it was possible to meet the learner needs. The data indicates positive results. The degree to which this indication may be extrapolated in time and numbers to entire schools systems for entire school years is limited by the restriction of time and numbers in this pilot effort.

In summary, the hypothesis that Environmental Education can be most meaningful when geared to those in need (preadolescent learners with identified learning limitations and environmental complexities confronting them) was found to be valid within this pilot. Therefore serious consideration should be given to focusing environmental education efforts toward learner need rather than, as is presently all too common, focusing on topics which are of concern to the presenter and incidental to the learner.

ABSTRACT

Environmental Education Project

IT

This proposal is an extension of the project which was awarded an HEW grant in FY78. Assistance is requested from the Office of Environmental Education, HEW, to field test a model for the development of environmental education tailored to local needs. Thereby, a vehicle will be provided for infusing into classrooms those processes necessary for the development of an individual technology (IT) by which students will become capable of handling the complexities of the future. The proposal is directed toward one of the "Educational Goals for West Virginia" which states: "Each individual shall acquire knowledge and appreciation of the environment and recognize personal responsibility for its quality." Two staff positions, a full time environmental education specialist and a half-time secretary, are included in this request. Total funds requested are $38,362.

This project will provide an opportunity to field test the pilot project in meeting the above stated goal for environmental education. In order to meet this goal the project will continue to conduct an analysis of the major factors: socio-technological change, problem-solving capabilities; and to compile and analyze data relative to regional environmental education need.

The project will prepare to meet these needs by developing and conducting inservice activities, providing supervisory assistance and promotional activities, and evaluating the effectiveness of the project.

The symbol "IT" was selected for this project because 1) "IT" is a simple two-letter word representing a thing of unknown complexity, and 2) "IT" stands for individual technology--that quality within one which makes it possible to comprehend the complex changes of the world around you.

WEST VIRGINIA DEPARTMENT OF EDUCATION

ENVIRONMENTAL EDUCATION PROJECT

This project will develop a generic model for the development of environmental education tailored to local needs. Thereby, providing a vehicle for infusing into classrooms those processes necessary for the development of an individual technology (IT), by which students will become capable of handling the complexities of the future.

The project was awarded financial assistance by the Department of Health, Education and Welfare, Office of Education for the period July 1, 1977 to June 30, 1978.

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State Superintendent of Schools

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West Virginia Department of Education

RANKING OF RESAS IN WEST VIRGINIA BY SOCIO-TECHNOLOGICAL FACTORS IMPACTING GRADES 1 - 8

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March 1978

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The project is funded by a grant
from the U.S. Office of Education
(No. G007701355)

The ranking of Regions for socio-technical impacts on students of grades four through eight was approached as though there were no existing protocols for such rankings.

In looking at the socio-technological factors and recording weighted scores for them, it should be made clear at the outset that each final column of factors was established with knowledge of the statewide totals in mind of the preceeding columns of socio-technological factor totals for the state in mind. This statement is made in retrospect and was not a conscious review. This is repeated in part in the following three paragraphs.

As each column of socio-technological factors was decided upon, calculated, provided with a scaling system, etc., the weighting factor was decided upon with awareness in the mind of the consultant of the magnitudes and natures of the columns that preceded it, both as to the magnitude of greatest and lesser items in each county and in each RESA.

It is recognized that the entire system represents the knowledge about West Virginia's factors known to the consultant at the time the choices were made. Subjective judgments were applied in selecting the factors and determining the methods of dealing with the objective and subjective numbers.

Discussions with other knowledgeable people allowed the additional use of their judgments about their knowledge to be added to the many years of experience and knowledge of the specialist.

Some apparently new concepts or new applications of older concepts are presented for immediate use as well as for the possible use by others who will improve all or most of them, it is to be hoped.

BASIC DEMOGRAPHY

POPULATION*

RESA I	POPULATION	SQUARE MILES
McDowell	50,900	538
Mercer	65,800	424
Monroe	11.600	474
Raleigh	75,200	610
Summers	13,500	368
Wyoming	31,800	507
Total	248,800	2,921

RESA II		
Cabell	104,900	286
Lincoln	19,800	437
Logan	46,000	456
Mason	25,100	446
Mingo	33,500	424
Wayne	38,600	518
Total	267,900	2,567

RESA III		
Boone	27,300	506
Clay	9,600	347
Kanawha	223,700	230
Putnam	30,200	351
Total	290,800	1,434

RESA IV		
Braxton	13,000	520
Fayette	51,700	667
Greenbrier	32,600	1,023
Nicholas	23,700	657
Pocahontas	8,500	943
Webster	10,000	559
Total	139,500	4,369

RESA V		
Calhoun	7,400	280
Jackson	21,400	472
Pleasants	7,500	135
Ritchie	10,300	455
Roane	14,600	486
Tyler	9,900	260
Wirt	4,400	234
Wood	87,000	378
Total	162,500	2,706

RESA VI	POPULATION	SQUARE MILES
Brooke	30,300	93
Hancock	39,800	89
Marshall	38,500	314
Ohio	61,100	109
Wetzel	20,600	360
Total	190,300	965

RESA VII		
Barbour	15,200	345
Doddridge	6,500	322
Gilmer	7,900	342
Harrison	74,900	418
Lewis	17,800	391
Marion	63,200	314
Monongalia	68,300	369
Preston	26,500	654
Randolph	26,100	1,046
Taylor	14,900	177
Tucker	7,400	422
Upshur	20,700	355
Total	535,700	5,155

RESA VIII		
Berkeley	39,900	325
Grant	8,800	478
Hampshire	12,700	641
Hardy	9,100	576
Jefferson	23,700	212
Mineral	24,500	330
Morgan	8,700	231
Pendleton	7,400	697
Total	134,800	3,490

State Total 1,784,415

*1974 Dr. Sizer's Study (Page 11 Rounded to 100)

Socio-Technological Factor I

Each county was treated separately in each RESA that had what the specialist considered a major man-made disaster. The other RESAs were rated one on a 1-8 scale.

The multiplying (weighting factors) were selected as follows:

In RESA II a weighting factor of 100 was selected because of the unexpectedness and the obvious technological-managerial errors involved, as well as the recognized psychological trauma in the Buffalo Creek dam collapse. (The heavy rain, originally espoused as "the God's Will," was rapidly clarified as being well within the normal variations of expected weather.) In the Silver Bridge collapse, the obviously poor design with no redundancy of structural elements, was much later learned to have had the specific initial crack initiated by a sulphurous acidic air pollutant. The Williamson Flood was considered minor relative to the others.

In RESA VII a weighting factor of 40 was assigned. The scale number 8 on a 1-8 scale, equal to the Buffalo Creek and Silver Bridge collapse, appeared to be fully justified because even though a mine explosion is more "expected" than are bridge and dam collapses, the long trauma of extended time for the recovery of the dead miners' bodies, not yet complete, carries its load of technological-managerial burden in children's minds, it is believed.

Disasters - Man

RESA I, III, IV, V, VI, VII - No major event. Scale 1 x Factor 1 = 1 each.

RESA II: Mason - Silver Bridge

Logan - Buffalo Creek and Williamson Flood

Mingo - Williamson Flood Scale of 8 x Factor 100 = 800

RESA VII

Marion - Farmington Mine, 1968 Scale of 8 x Factor 40 = 320

Socio-technological Factors / Counties and Regions	1 Disasters Man*	2 Disasters Nature*	3 Television*	4 Total Surfaced Mined Acreage/Mile *	5 Unreclaimed Surface Mined Acreage/Mile *	6 Water Pollution Prosecutions 1975-1977	7 Difference in Mining Employment 1965-1974	8 Mining Employment as percent of total Population, 1974 x 100	9 Roads Improvement 1960-1973	10 Non-Mining Employment *	Summation by Region	Socio-technological Rank 8 greatest need 1 least need
(McDowell, Mercer, Monroe, Raleigh, Summers, Wyoming)												
Totals/Region I	1	8	260	35	140	128	168	620	310	240	1,910	7
(Cabell, Lincoln, Logan, Mason, Mingo, Wayne)												
Total/RegionII	800	12	140	30	120	149	16	400	275	240	2,182	8
(Boone, Clay, Kanawha, Putnam)												
Total/Region III	1	8	80	40	160	150	150	160	300	60	1,709	4
(Braxton, Fayette, Greenbrier, Nicholas, Pocahontas, Webster)												
Total/Region IV	1	6	320	25	100	24	97	620	190	80	1,463	6
(Calhoun, Jackson, Pleasants, Ritchie, Roane, Wirt, Wood, Tyler)												
Total/Region V	1	8	160	1	1	28	1	1	205	300	706	1
(Brooke, Hancock, Marshall, Ohio, Wetzel)												
Total/Region VI	1	10	40	35	140	5	225	150	100	70	776	2
(Barbour, Doddridge, Gilmer, Lewis, Harrison, Marion, Monongalia, Preston, Randolph, Taylor, Tucker, Upshur)												
Total/Region VII	320	1	180	35	140	108	20	260	150	80	1,294	5
(Berkeley Grant, Jefferson, Hampshire, Hardy Mineral, Morgan, Pendleton)												
Total/Region VIII	1	4	260	10	40	3	150	130	150	350	1,053	3
Statewide Totals	1126	57	1440	211	841	595	782	2441	1680	1420	11,093	

*Index Determination

Socio-Technological Factor 2

Disasters-Nature were selected after discussions with West Virginia's specialist responsible for civil preparedness. Each major event in each county was counted. The weighting factor of 2 was chosen to provide a score that seemed to appropriate as a statewide total for these expected events in which technology plays little part. The flood losses directly attributable to building in flood plains, and the tornado losses attributable to mobile- and factory-built homes that are not well anchored do not seem to have the troublesome impacts on children as do the obviously man-made disasters, in the judgment of the specialist.

Factor 2

Disasters - Nature

RESA I (Raleigh, Summers, Wyoming) - 1969 Flood, 1977 Tornado

Events: 4 Factor: 2 Score: 8

RESA II (Cabell, Logan, Mason) - 1964 Flood

Events: 4 Factor: 2 Score: 8

RESA III (Boone, Kanawha, Clay) - 1969 Flood, 1964 Flood

Events: 4 Factor: 2 Score: 8

RESA IV (Fayette, Pocahontas, Greenbrier) - 1969 Flood, 1977 Tornado

Events: 3 Factor: 2 Score: 6

RESA V (Jackson, Pleasants, Tyler, Wood) - 1964 Flood

Events: 4 Factor: 2 Score: 8

RESA VI (Brooke, Hancock, Marshall, Ohio, Wetzel) - 1964 Flood

Events: 5 Factor: 2 Score: 10

RESA VII No major events.

Events: 1 Factor: 1 Score: 1

RESA VIII (Berkeley, Jefferson) - 1969 Flood

Events: 2 Factor: 2 Score: 4

Socio-Technological Factor 3

The Television index determination was developed to provide both the "past rate of change" and the "expected future change" factor.

These were determined by examining the percentage of households with TV for each county, using American Research Bureau figures in the TV Factbook published annually. The percentages of an earlier year (1961) were compared with the percentages of a recent year (1974). This determined the past rate of change to reflect the introduction of new vicarious experiences, viewpoints, and technologies.

The 1974 figures of the numbers of TV households with TV were used by subtracting these numbers from the total numbers of households reported to be in existence in each county in the same ARB reports.

It was interesting to see that the RESA with the lowest 1974 TV percent penetration was also the RESA with the greatest increase between 1961 and 1974.

The index was established by a simple RESA ranking of the 1961-74 difference percentages plus RESA ranking of the non-TV 1974 household percentages. This sum of rankings was multiplied by a judgment weighting factor of 20.

It will be recognized that the greatest factor in TV penetration is the availability of electricity. The next greatest factor is probably the availability of community cable TV antennae systems. The addition of TV broadcasting stations and repeaters are later, additional factors. It is probable, although not certain, that a high disposable income encouraged individual installations sooner of individual household antenna extensions to hilltops, etc.

No attempt was made to explore the technological and socio-cultural impacts of the Citizens' Band (CB) radio phenomenon, with its socio-drama aspects and the increased interpersonal communication aspects, nor to try to relate CBs to a possible acceleration of TV penetration into more households because, in part, a CB base attenna was being provided anyway.

Factor 3

Impact of Television 1961 - 1974
(Based on information in ARB Report)

	1961 Household/TV	No TV	%TV	1973-1974 Household/TV	No TV	% TV	% Difference 1961-1974
RESA I							
McDowell	13,600	4,300	76	13,700	900	94	18
Mercer	16,400	3,400	83	20,900	900	96	13
Monroe	2,000	1,000	67	2,800	400	88	21
Raleigh	17,600	4,000	81	21,600	1,100	95	14
Summers	3,300	1,200	73	4,100	400	91	18
Wyoming	7,400	2,100	78	8,000	500	94	16
Totals	60,300	16,000	(79.0)	71,100	4,200	(94.4)	(15.4)
RESA II							
Cabell	31,900	3,300	91	36,000	900	98	7
Lincoln	3,800	1,200	76	5,700	300	95	19
Logan	13,000	2,600	83	12,700	500	96	13
Mason	5,100	1,100	82	7,900	200	98	16
Mingo	7,900	2,200	78	8,500	500	94	16
Wayne	7,200	1,700	81	12,700	500	96	15
Total	68,900	12,100	(85.1)	82,800	2,900	(96.6)	(11.5)
RESA III							
Boone	5,000	1,100	81	7,500	300	96	14
Clay	2,400	1,100	72	2,600	200	93	20
Kanawha	62,100	7,400	89	72,400	1,900	97	8
Putnam	4,600	1,300	77	8,700	200	98	20
Total	74,100	10,700	(87.4)	91,200	2,600	(97.2)	(9.8)
RESA IV							
Braxton	3,100	1,300	70	3,600	300	92	22
Fayette	14,100	4,000	78	15,200	600	96	18
Greenbrier	7,000	2,300	75	9,900	700	93	18
Nicholas	5,200	1,700	75	6,900	300	96	21
Pocahontas	1,800	1,100	62	2,300	400	85	23
Webster	2,500	1,400	64	2,700	200	93	29
Total	33,700	11,800	(74.:)	40,600	2,500	(94.2)	(20.1)
RESA V							
Calhoun	1,400	700	67	2,300	200	92	25
Jackson	3,200	600	84	6,200	200	97	13
Pleasants	1,500	100	94	2,200	100	96	12
Ritchie	2,600	900	74	3,500	300	92	18
Roane	2,700	1,000	73	4,400	300	94	21
Tyler	2,000	800	71	3,100	200	94	23
Wirt	900	400	69	1,300	100	93	24
Wood	24,000	2,700	90	28,800	1,000	97	7
Total	38,300	7,200	(84.4)	51,800	2,400	(95.6)	(11.2)
RESA VI							
Brooke	6,600	800	89	8,800	100	99	10
Hancock	9,200	1,200	88	12,200	100	99	11
Marshall	9,500	1,600	85	12,200	300	98	13
Ohio	20,400	600	97	22,300	400	98	
Wetzel	4,100	700	85	7,000	200	97	12
Total	49,800	4,900	(91.0)	62,500	1,100	(98.3)	(7.3)

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Factor 3 - Impact of TV 1961-1974 (Cont'd)

	1961 Household/TV	No TV	%TV	1973-1974 Household/TV	No TV	%TV	% Difference 1961-1974
RESA VII							
Barbour	2,900	1,500	66	4,100	300	93	27
Doddridge	1,100	800	58	2,100	100	95	37
Gilmer	1,200	700	63	2,000	200	91	29
Harrison	19,600	2,100	90	24,700	600	98	8
Lewis	4,100	800	84	5,800	300	95	11
Marion	16,700	2,300	88	21,000	700	97	9
Monongalia	12,700	2,400	84	19,400	1,000	95	11
Preston	5,300	1,100	82	7,600	400	95	12
Randolph	4,700	2,400	66	7,200	500	94	18
Taylor	3,500	900	80	4,400	300	94	14
Tucker	1,600	500	76	2,400	200	92	16
Upshur	3,100	1,900	62	6,300	300	95	33
Total	76,500	17,400	(81.5)	107,000	4,900	(95.6)	(14.1)
RESA VIII							
Berkeley	7,300	1,200	86	12,300	400	97	11
Grant	1,300	900	59	2,600	300	90	31
Hampshire	2,600	700	79	3,900	300	93	14
Hardy	1,400	900	61	2,600	300	90	29
Jefferson	3,700	600	82	6,700	200	97	15
Mineral	4,400	1,400	76	7,600	400	95	19
Morgan	1,800	500	78	3,100	100	97	19
Pendleton	1,300	900	59	2,300	200	92	33
Total	23,800	7,100	(77.0)	41,000	2,200	(94.9)	(17.9)

Factor 3

TV Index

RESA	% TV Households, 1974	Rank High 1 Low 8	% TV Households, 1974 Minus 1961	Rank Low 1 High 8	Sum of Ranks	Weight Multiplier	Score
I	94.4	7	15.4	6	13	20	260
II	96.6	3	11.5	4	7	20	140
III	97.2	2	9.8	2	4	20	80
IV	94.2	8	20.1	8	16	20	320
V	95.6	5	11.2	3	8	20	160
VI	98.3	1	7.3	1	2	20	40
VII	95.6	4	14.1	5	9	20	180
VIII	94.9	6	17.9	7	13	20	200
						Statewide Total	1,440

Socio-Technological Factor 4

Surface mining introduces many children to large earth-moving equipment for the first time in their lives. For these children and others, surface mining introduces heavy trucking also, for direct observation, as topics from neighbors and kin who are employed in this work, and in the related equipment sales and repair work, and as observers of and recipients of environmental changes due to noise, dust, traffic, ground vibration, and silting of streams plus other interferences to hunting, fishing and free roaming during the operations and during the cleanup in many instances. The acres per square mile of county, with the "no acreage" counties excluded, were graded for each RESA with a judgment scale between 1 and 8. RESA V was given the grade of "1." A weighting factor of 5 was applied to the grade for each RESA except for RESA V:

I $7 \times 5 = 35$

II $6 \times 5 = 30$

III $8 \times 5 = 40$

IV $5 \times 5 = 25$

V $1 \times 1 = 1$

VI $7 \times 5 = 35$

VII $7 \times 5 = 35$

VIII $2 \times 5 = 10$

Factors 4 & 5

Surface Mining Total Acreage

	Acres of Surface Removed by Mining	Acres of Surface Reclaimed
RESA I		
McDowell	12,960	4,400
Mercer	5,600	0
Monroe	0	0
Raleigh	10,200	5,300
Summers	0	0
Wyoming	8,600	4,000
	37,360	13,700
RESA II		
Cabell	0	0
Lincoln	13	0
Logan	7,306	3,205
Mason	340	0
Mingo	8,631	4,445
Wayne	78	18
	16,368	7,668
RESA III		
Boone	21,154	15,212
Clay	891	537
Kanawha	25,502	14,906
Putnam	0	0
	45,547	30,655
RESA IV		
Braxton	601	118
Fayette	17,400	5,763
Greenbrier	5,381	2,568
Nicholas	5,703	1,675
Pocahontas	363	93
Webster	1,690	678
	31,138	10,895
RESA V		
Calhoun	0	0
Jackson	0	0
Ritchie	0	0
Roane	0	0
Wirt	0	0
Wood	0	0

Factors 4 & 5 - Surface Mining (Cont'd)

	Acres of Surface Removed by Mining	Acres of Surface Reclaimed
RESA VI		
Brooke	3,948	743
Hancock	491	138
Marshall	0	0
Ohio	81	0
Wetzel	136	136
	4,656	1,017
RESA VII		
Barbour	15,270	5,392
Doddridge	0	0
Gilmer	0	0
Harrison	26,629	3,694
Lewis	11,603	4,107
Marion	677	218
Monongalia	3,974	1,790
Preston	14,755	5,188
Randolph	4,970	3,161
Taylor	2,778	185
Tucker	2,241	546
Upshur	3,254	921
	86,051	25,202
RESA VIII		
Berkeley	0	0
Grant	2,548	2,156
Hampshire	15	15
Hardy	0	0
Jefferson	0	0
Mineral	1,604	436
Morgan	0	0
Pendleton	0	0
	4,167	2,607
TOTAL	225,287	91,744

Index for Factors 4 & 5

Surface Mining

RESA	Square Miles	RESA Square Miles of Counties Surface Mined	Total Acres Per Square Miles of Counties Surface Mined	Unreclaimed Acres Per Square Miles of Counties Surface Mined	Rating on 1-8 Scale
I	2,497	1,655	226.0	8.3	7
II	2,567	880	186.0	8.7	6
III	1,434	736	64.6	41.6	8
IV	4,369	2,347	13.3	4.6	5
V	2,706	2,706	0	0	1
VI	965	182	25.6	5.6	7
VII	5,155	4,355	20.0	6.0	7
VIII	3,490	808	5.0	3.0	2

Socio-Technological Factor 5

Unreclaimed surface mining introduces doubts about the validity of technology and of managerial and governmental authorities who are directly responsible for reclamation and who are responsible for regulatory enforcement and preventive restraint where indicated. The acres per square mile of each county, with the "no acreage" counties excluded, were graded for each RESA with a judgment between 1 and 8. RESA V was given the grade of "1." A weighting factor of 20 was applied to the grade for each RESA as follows, with the exception of RESA V:

I 7 x 20 = 140

II 6 x 20 = 120

III 8 x 20 = 160

IV 5 x 20 = 100

V 1 x 1 = 1

VI 7 x 20 = 140

VII 7 x 20 = 140

VIII 2 x 20 = 40

Socio-Technological Factor 6

Water pollution is an environmental media contamination that is more rapidly recongnized as a technological impact when it originates or increases rapidly during the lifetime of the child or his parents who relate the earlier cleanliness to fishing, swimming, boating, etc. If the water pollution has not changed from being bad during the parents' lifetime, it is less likely to have any recognizable effect upon their attitudes and aptitudes for learning. One exception to this is when an influx of immigrants who are accustomed to better water for themselves and, on occasion, their employer's processes, push the local, state, or federal authorities into regulatory action. Another exception is when a previously acceptable pollution is clearly shown to be cleanable at a modest increase in prices or is shown to be dramatically harmful to the health of children. Fishing tackle and motor boats also all technology.

The measurement that most readily reflects the holistic impact of the children, their parents, and the body politic (area public in general) may well be the number of water pollution prosecutions undertaken by the West Virginia Department of Natural Resources. The number of such prosecutions was, therefore, taken as the score for each RESA. No weighting factor seemed to be required.

Prosecutions of the

West Virginia Department of Natural Resources

County	1976-77 Reclamation	1976-77 Water Pollution	1975-76 Reclamation	1975-76 Water Pollution
Barbour	1	0	6	0
Berkeley	0	0	0	0
Boone	44	39	16	62
Braxton	1	4	2	2
Brooke	4	0	0	0
Cabell	0	0	0	0
Calhoun	0	1	0	0
Clay	2	2	4	5
Doodridge	0	0	0	0
Fayette	52	5	15	3
Gilmer	1	6	0	3
Grant	1	0	1	0
Greenbrier	25	2	16	1
Hampshire	0	0	0	0
Hancock	1	0	0	0
Hardy	0	0	0	0
Harrison	9	4	15	5
Jackson	0	0	0	0
Jefferson	0	0	0	0
Kanawha	40	17	43	21
Lewis	13	2	3	0
Lincoln	0	0	0	4
Logan	32	56	16	53
McDowell	13	16	15	37
Marion	3	2	2	0
Marshall	0	2	0	2
Mason	0	0	1	0
Mercer	2	3	1	2
Mineral	5	2	3	1
Mingo	30	8	29	28
Monongalia	3	6	2	0
Monroe	0	0	0	0
Morgan	0	0	0	0
Nicholas	27	0	3	3
Ohio	0	0	0	1
Pendleton	0	0	0	0
Pleasants	0	0	0	0
Pocahontas	0	0	0	0
Preston	17	3	7	0
Putnam	0	2	1	2

Water Pollutions - Dept. of Natural Resources (Cont'd)

County	1976-77 Reclamation	1976-77 Water Pollution	1975-76 Reclamation	1975-76 Water Pollution
Raleigh	26	11	15	12
Randolph	8	4	4	1
Ritchie	0	0	0	0
Roane	0	1	0	8
Summers	0	1	0	0
Taylor	2	0	6	0
Tucker	4	0	3	0
Tyler	0	2	[illegible]	1
Upshur	3	15	1	2
Wayne	0	0	0	0
Webster	8	2	3	3
Wetzel	0	0	0	0
Wirt	0	0	0	0
Wood	0	1	0	0
Wyoming	23	12	7	34
Total	400	231	240	296

Factor 6

Water Pollution Prosecutions

RESA I	
McDowell	53
Mercer	5
Monroe	0
Raleigh	23
Summers	1
Wyoming	46
Total	128

RESA II	
Cabell	0
Lincoln	4
Logan	109
Mason	0
Mingo	36
Wayne	0
Total	149

RESA III	
Boone	101
Clay	7
Kanawha	38
Putnam	4
Total	150

RESA IV	
Brooke	5
Fayette	8
Greenbrier	3
Nicholas	3
Pocahontas	0
Webster	5
Total	24

RESA V	
Calhoun	1
Jackson	0
Pleasants	0
Ritchie	0
Roane	9
Tyler	17
Wirt	0
Wood	1
Total	28

RESA VI	
Brooke	0
Hancock	0
Marshall	4
Ohio	1
Wetzel	0
Total	5

RESA VII	
Barbour	0
Doddridge	0
Gilmer	9
Harrison	9
Lewis	2
Marion	53
Monongalia	6
Preston	3
Randolph	5
Taylor	0
Tucker	0
Upshur	17
Total	108

RESA VIII	
Berkeley	0
Grant	0
Hampshire	0
Hardy	0
Jefferson	0
Mineral	3
Morgan	0
Pendleton	0
Total	3

DNR 1975-76-77 - Used totals as actual score

Socio-Technological Factor 7

Mining is a technological activity that differs drammatically from other employments because it is the most hazardous of trades, on a per man-hour employed basis; and because the child is rarely aware of anything about his parent's mining work except that it is hazardous, noisy, dusty and except for some surface mining, takes place someplace where the child is truly excluded. In passing, it can be pointed out that only very recently has there been shown documentary TV film of a mine as the miner works in it.

Mining employments between 1965 and 1974 were reviewed, using Sizer's figures.

A decrease in mining employment was given a lower weighting factor than was an increase in mining employment between 1965 and 1974, using the differences in percentage of population who are employed in mining as the data abstraction to which the weighting factor was applied.

Factor 7

Difference in Mining Employment 1965-1974
As a Percent of Total Population

(With a multiplier of 150 if mining employment was added and a multiplier of 100 if mining employment was lost)

RESA	I	1.12% x 150 = 168	
RESA	II	0.45% x 150 = 68	
		0.33% x 100 = 33	(Loss of 900).
		101	Score
RESA	III	1% x 150 = 150	
RESA	IV	1.56% x 150 = 234	
RESA	V	1% x 1 = 1	
RESA	VI	1.5% x 150 = 225	
RESA	VII	0.2% x 100 = 20	
RESA	VIII	0.7% x 150 = 105	

The multiplying factors of 150 versus 100 were selected based on the view that adding new mining jobs to people in an area is more technologically and economically disturbing, whether or not it was stimulating and exciting to children, than is the loss of mining jobs.

The choice of 150 and 100 as against the possible choice of 3 and 2 as multipliers was a continuation of the judgment as to what the total score (for all RESAs for socio-technological factor) ought to be based on the earlier total scores for all RESAs for an item.

Factors 7 & 8

	Population 1974	Miles	1970 Population Density	Mining Employment 1965	Mining Employment 1974	Mines % of Population x 100	Difference in Mining Employment 1965-1970
ESA I							
McDowell	50,800	538	94	5,000	6,200		1,200
Mercer	65,800	424	149	400	500		100
Monroe	11,600	474	24	0	0		0
Raleigh	75,200	610	115	3,200	3,800		600
Summers	13,500	368	36	0	0		0
Wyoming	31,811	507	59	4,000	4,900		900
Total	248,711	2,921	(Overall 85 population density)	12,600	15,400	620	2,800
ESA II							
Cabell	104,900	286	367	0	0		0
Lincoln	19,800	437	45	0	0		0
Logan	46,000	456	101	4,700	3,800		-900
Mason	25,100	446	56	200	500		+300
Mingo	34,500	424	81	1,500	1,500		0
Wayne	38,600	518	75	4,000	4,900		900
Total	268,900	2,567	(Overall 85)	10,400	10,700	400	300
ESA III							
Boone	27,300	506	50	2,100	4,300		2,200
Clay	9,600	347	27	0	0		0
Kanawha	223,700	230	251	2,600	3,300		700
Putnam	30,200	79	0	0	0		0
Total	290,800	1,434	(Overall 203)	4,700	7,600	260	2,900
ESA IV							
Braxton	13,000	520	24	2,100	4,300		2,200
Fayette	51,700	667	75	2,400	1,600		-800
Greenbrier	32,600	1,023	31	400	300		-100
Nicholas	23,700	657	34	2,500	2,400		-100
Pocahontas	8,500	943	9	0	0		0
Webster	10,000	559	18	400	100		-300
Total	139,500	4,369	(Overall 32)	7,800	8,700	620	900
ESA V							
Calhoun	7,400	286	25	0	0	0	0
Jackson	21,400	472	44	0	0	0	0
Pleasants	7,500	135	54	0	0	0	0
Ritchie	10,300	455	22	0	0	0	0
Roane	14,600	486	29	0	0	0	0
Tyler	9,900	260	38	0	0	0	0
Wirt	4,400	234	18	0	0	0	0
Wood	87,000	378	230	0	0	0	0
Total	162,500	2,706	(Overall 197)	0	0	0	0

actors 7 & 8 (Cont'd)

	Population 1974	Miles	1970 Population Density	Mining Employment 1965	Mining Employment 1974	Mines % of Population x 100	Difference in Mining Employment 1965-1970
ESA VI							
Brooke	30,300	93	329	0	0		0
Hancock	39,800	89	449	0	0		0
Marshall	38,500	314	119	0	2,000		2,000
Ohio	61,100	109	582		800		800
Wetzel	20,600	360	56	0	0		0
Total	190,300	965	(Overall 197)	0	2,800	150	2,800
ESA VII							
Barbour	15,200	345	41	800	1,100		300
Doddridge	6,500	322	20	0	0		0
Gilmer	7,900	342	24	0	25		0
Harrison	74,900	418	175	1,700	1,000		-700
Lewis	17,800	391	46	300	100		-200
Marion	63,200	314	196	2,900	1,600		-1,300
Monongalia	68,300	369	173	1,700	3,700		2,000
Preston	26,500	654	39	1,300	700		-600
Randolph	26,100	1,046	24	500	400		-100
Taylor	14,900	177	78	200	0		-200
Tucker	7,400	422	18	100	0		-100
Upshur	20,700	355	54	200	400		200
Total	349,400	5,155	(Overall 888)	9,700	9,000	260	-700
ESA VIII							
Berkeley	39,900	325	112	800	1,100		300
Grant	8,800	478	18	?	600		600
Hampshire	12,717	641	18	0	0		0
Hardy	9,141	576	15	0	0		0
Jefferson	23,700	212	100	0	0		0
Mineral	24,500	330	70	?	100		100
Morgan	11,600	231	37	0	0		0
Pendleton	7,400	697	11	0	0		0
Total	137,758	3,490	(39 Overall)	800	1,800	130	1,000

Socio-Technological Factor 8

The ratio of mining employment to the total population was considered to have an impact on children and their parents, with a larger percentage of miners being more important. The generally perceived idea that added schooling is not necessary and that available mining jobs permit one to start earning adult wages sooner and enter the "fraternity" of adult miners sooner with less education serves to inhibit studying the mathematical and scientific abstractions of reality that lead to higher technological skills. The sociological impact is undoubtedly the "leading away" from scholarship and toward employment where skills are learned on the job in and near the mines (From discussions with sociologists who have studied coal mining groups Photiadis & Gibbard - West Virginia University - Late 1977).

A weighting factor of 100 was applied to the very small numbers that are the percentages of mining employment to the total population. The statewide total score seemed to be appropriate in the light of preceding socio-technological factor scores. RESA V was given a rating of 1 and a weight of 1.

RESA	I	6.2 x 100	= 620
RESA	II	4 x 100	= 400
RESA	III	2.6 x 100	= 260
RESA	IV	6.2 x 100	= 620
RESA	V	1 x 1	= 1
RESA	VI	1.5 x 100	= 150
RESA	VII	2.6 x 100	= 260
RESA	VIII	1.3 x 100	= 130

Socio-Technological Factor 9

Good roads are considered to be a significant factor in opening up more rural areas to the influence of increased technological developments and socio-economic changes. The effect of any given number of miles of high-type roads, with figures from the State's highway department, is undoubtedly greater in an area with few miles than in an area with a large number of miles of such roads. For this reason the percentage increase in high-type roads between 1960 and 1973 was used using the 1960 mileage as the base year. A factor of 5--a weighting factor--was applied to the percentage increase to arrive at the scores for each RESA. The factor of 5 was chosen because it seemed to be appropriate in the light of the previous statewide scores for factors developed earlier.

It should be pointed out that the good roads allow more school classes to visit centers of higher and different technologies and cultural centers. They also allow parents to drive children farther during spare time. They also make it easier for out-migrant kin and neighbors to return during vacations and factory layoffs, brining with them validations of factors seen on TV that might otherwise be considered remote or unreal to the child.

Factor 9

Roads As A Factor

Areas I-VIII	No. Miles of High-Type Roads/1960	Per 100 Sq. Miles	No. Miles of High-Type Roads/1973	Per 100 Sq. Miles	Difference Between 1960-1973	Per 100 Sq. Miles	% of Difference Divided by 1960
I							
McDowell	148	27	235	44	87	17	63
Mercer	163	38	279	66	116	28	74
Monroe	109	23	191	40	82	17	74
Raleigh	185	30	278	46	93	16	53
Summers	145	39	216	59	71	20	51
Wyoming	95	19	181	36	86	17	89
Total	845	(29)	1,380	(47)	535	(18)	(62)
					(Score 62% x 5 = 310)		
II							
Cabell	154	54	253	88	99	34	63
Lincoln	63	13	114	24	51	11	85
Logan	146	32	203	45	57	13	41
Mason	124	28	197	44	73	16	57
Mingo	110	26	180	43	70	17	65
Wayne	138	27	216	42	78	15	56
Total	735	(29)	1,163	(45)	428	(16)	(55)
					(Score 55% x 5 = 275)		
III							
Boone	136	27	178	35	42	8	30
Clay	72	21	117	34	45	13	62
Kanawha	301	33	510	56	209	23	70
Putnam	98	28	163	47	65	19	68
Total	607	(42)	968	(67)	361		(60)
					(Score 60% x 5 = 300)		
IV							
Braxton	104	20	163	31	59	11	55
Fayette	268	41	370	56	102	15	37
Greenbrier	266	26	419	41	153	15	58
Nicholas	190	29	235	36	45	7	24
Pocahontas	198	21	250	27	52	6	29
Webster	102	18	140	25	38	7	39
Total	1,128	(26)	2,705	(36)	449	(10)	(38)
					(Score 38% x 5 = 190)		
V							
Calhoun	65	23	104	37	39	14	61
Jackson	118	25	211	45	93	20	80
Pleasants	34	25	42	31	8	6	24
Ritchie	120	26	181	40	61	14	54
Roane	91	19	124	26	33	7	37
Tyler	81	31.14	80	30.76	(-1)	(-1)	-3
Wirt	53	23	91	39	38	16	70
Wood	157	42	198	52	41	10	24
Total	719	(27)	1,031	(38)	312	(11)	(41)
					Score 41% x 5 = 205)		

RSAs I-VIII	No. Miles of High-Type Roads/1960	Per 100 Sq. Miles	No. Miles of High-Type Roads/1973	Per 100 Sq. Miles	Difference Between 1960-1973	Per 100 Sq. Miles	% of Difference Divided by 1968
VI							
Brooke	60	65	79	85	19	20	31
Hancock	70	79	98	111	28	32	41
Marshall	135	43	150	48	15	5	12
Ohio	119	109	132	121	13	12	11
Wetzel	163	45	190	53	27	8	18
Total	719	(56)	649	(67)	102	(11)	(20)
						(Score 20% x 5 = 100)	
VII							
Barbour	131	38	190	55	59	17	45
Doddridge	80	25	104	32	24	7	28
Gilmer	89	27	107	33	18	6	22
Harrison	238	57	281	67	43	10	18
Lewis	92	24	144	37	52	13	54
Marion	190	61	233	74	43	13	21
Monongalia	199	54	243	66	44	12	22
Preston	217	33	244	37	27	4	12
Randolph	188	18	307	29	119	11	61
Taylor	101	57	108	61	7	4	7
Tucker	95	23	143	34	48	11	48
[illegible]hur	88	25	145	41	57	16	64
Total	1,708	(33)	2,249	(43)	541	(10)	(30)
						(Score 30% x 5 = 150)	
VIII							
Berkeley	200	62	275	85	75	23	37
Grant	97	20	116	24	19	4	20
Hampshire	133	21	180	28	47	7	33
Hardy	116	20	123	21	7	1	5
Jefferson	114	54	137	65	23	11	20
Mineral	87	26	125	38	38	12	46
Morgan	91	39	108	47	17	8	21
Pendleton	104	16	157	24	53	8	50
Total	942	(27)	1,221	(35)	279	(8)	(30)
						(Score 30% x 5 = 150)	

[illegible]re is greater impact considered to be developed by the addition of roads on a geographic concentration basis and what was developed was based on the differences in the miles of high-type roads per 100 square mile of area.

Table 3-8 of Sizer Report 1977.

Factor 9

High-Type Roads

RESA	Sq. Miles	No. Miles of High-Type Roads 1960	1973	1973-1960	No. Miles 1960	100 Sq. Miles 1973	1973-60	1973-1960% / 1960%
I	2,921	845	1,380	535	29	47	18	62 x 5 = 310
II	2,567	735	1,163	428	29	45	16	55 x 5 = 275
III	1,434	607	968	361	42	67	25	60 x 5 = 300
IV	4,369	1,128	1,537	449	26	62	36	38 x 5 = 190
V	2,706	719	1,071	312	127	163	36	41 x 5 = 205
VI	965	547	649	102	56	67	11	20 x 5 = 100
VII	5,155	1,708	2,249	541	33	43	10	30 x 5 = 150
VIII	3,490	942	1,221	279	27	35	8	30 x 5 = 150

Socio-Technological Factor 10

Manufacturing and other industrial installations were looked at with fresh eyes to assess the probable technologically induced impacts upon homes and children. The conventional wisdom held that a large technologically based industry would expose children to the new technology and thus stimulate some to learn technology and lead others to shrink away because of their seeming self-inadequacies.

It was instead concluded that adding a large (more than approximately 50 employees) industrial facility has almost no direct impact on children because the child does not observe or know what it is like inside the gates and inside the buildings, with few exceptions. The exceptions occur later in school when some teachers take some classes on plant tours. Even then, these do not show the more rugged activities such as those of a maintenance man father who repairs a large furnace or repairs an overhead manned crane.

At smaller factories it is more likely that a child will be taken inside to see what goes on some day when a mother takes the child along while delivering a lunch or picking up a father at work.

Whether the industrial establishment be large or small, it was reasonable to expect some new conversation about technological matters to be added at home. In addition, the child's observations of "outside building trades" construction workers on factories is stimulating. This is recognized in larger cities, too, where protective solid barrier fences are frequently provided with deliberately established peepholes for adult and smaller "sidewalk superintendents." The addition to a neighborhood of the children of some imported technical and managerial temporary or permanent personnel add some information and ideas to the dialogues of the earlier residents. Any relocation to a town or neighborhood that has such children from a more rural neighborhood also changes some of the content of the dialogues toward some what more technical topics.

The same probably happens when a college is enlarged and when new commercial or other institutional employments are added. The increased concentration, geographically, and sheer addition of more jobs and better pay add to the consumer purchasing and stimulate a child to learning more about "built" environments, including complex toys.

In the absence of any better rationale, it was decided to use each of two types of non-manufacturing employment analyses to establish the 1-8 ranking of RESAs. The weighting (multiplying) factor of 10 was selected and applied to these two rankings to provide a reasonable total weight of this socio-technological factor when compared to earlier factors' total scores.

Two brief anecdotes may illuminate the rejection of a simple "large plant has large impact" idea.

Many years ago, a steel mill in the midwest held a family open house plant tour for its thousands of employees. As I observed those in the line in front of me and behind me, I would see a man's arm pointing directly upward. I was certain he was describing his work as an overhead crane operator or crane maintenance man. Another arm and hand of a man near me, crouched to be near his child's ear level, was pointed at an open hearth's door with the man's arm then swinging back to point to the frontload carrying scrap buggy as it moved toward the open hearth's door. There was little doubt that the man was describing his work as a driver or a maintenance man for the scrap buggy.

This was the first time the children had a real feel for their parent's work technology and environment.

A recent check with a large West Virginia metals manufacturing plant brought out the fact that although they arranged for visits by classes at the initiative of the teacher, they had never had a "family" open house plant tour. The plant man responsible for this occasional activity, upon hearing of the preceding anecdotal experience, said he was reminded of an extensive interview by a young

woman doing a term paper on personnel practices. When the interview was over she asked if she could see what the roll house looked like. When questioned, she said, "I always heard my father talk about the rolling room and the roll house, but I never really know what it was and what he did. He died when I was 12."

The roll house superintendent was immediately phoned to take her on a guided tour, many years after her father had died.

The figures from Dr. Sizer take the total employment by county for 1960 and for 1974 and subtract mining employment by county in 1960 and 1974. A percent change between these years is determined for each RESA. The total area of each RESA is used with the 1974 non-mining employment number to arrive at geographic non-mining employment densities. Each RESA was ranked in order with the lower density area given the highest rank because it was assumed that adding employments in a more highly concentrated RESA had less impact than the addition of an equal number in a more sparsely non-mining area. (Reverse rank order - See Index Pg. 34)

The two rankings of each RESA were added because there was no basis for treating them differently. The resulting number was multiplied by a weighting factor of 10 because the resulting statewide score seemed to be appropriate to the previous socio-technological factors' statewide score totals.

At this point it might well be pointed out that during the past 10 to 15 years there have been reductions in air pollution of many types in most areas, except for some pollutants from mine-mouth power plants. The power plant added pollutants now tend to show up at greater distances and are not always recognizably attributed as technological impacts by people nearby. One example of a power plant that caused trouble to Christmas tree, potato, and flower growers is recognized but the effects of improvements in air pollution control are not known. There may be hangover effects for people who will not resume an operation, expecially agricultural, that has once been discontinued due to such problems.

Clean-ups of solid waste disposal burning dumps introduce very little technological change for children. As in the case of their pollutants, it is more often a case of the lost memory of a "toothache that has gone away."

Quieting noise and stilling vibrations, as well as cleaning up waters, are not usually technologically impacting on children. It is believed that these, too, are "treated as showers that have stopped."

Factor 10

RESA	Non-Mining Employment 1974-1960 / 1960 %	Rank Order	1974 Conc.	Square Mile Reverse Rank Order
I	118	4	20.7	6
II	189	8	51.8	3
III	115.5	3	51.8	3
IV	109.5	1	8.5	8
V	132.5	6	22.6	5
VI	155	7	105	1
VII	114	2	23	4
VIII	131	5	14	7

	Non-Mining Employment 1974/1960 Rank Order		1974 Conc. Reverse Rank Order		Weighting Multiplier		Factor Score
I	4	x	6	x	10	=	240
II	8	x	3	x	10	=	240
III	3	x	2	x	10	=	60
IV	1	x	8	x	10	=	80
V	6	x	5	x	10	=	300
VI	7	x	1	x	10	=	70
VII	2	x	4	x	10	=	80
VIII	5	x	7	x	10	=	350

Statewide Total 1,420

FACTOR 10

INDEX FOR NON-MINING EMPLOYMENT

RESA	Sq. Miles	Total Employed		Mining Employed		Non-Mining Employed		1975% 1964 Non-Mining	1974 Non-Mining No./Sq. Mile
		1960	1974	1960	1974	1960	1974		
I									
McDowell	538	15,232	12,040	7,522	6,167	7,180	5,873	75%	10.9
Mercer	424	18,931	23,420	427	508	18,504	22,912	124	54
Monroe*	474	3,373	3,280(A) (15,840 with Greenbrier)	0	0	3,373	3,280	97	6.9
Raleigh	610	18,643	25,010	3,601	3,758	15,042	21,252	141	34.8
Summers	368	3,527	3,710	0	30	3,527	3,680	104	10
Wyoming	507	7,650	8,420	4,633	4,946	3,017	3,474	-115	6.9
	2,921	67,356	75,880	16,083	15,409	51,273	60,471	118%	20.7

(A) Monroe is approximately 1/4 of Monroe plus Greenbrier Total Employment, per Sizes

II									
Cabell	286	37,260	91,900(B)	0	0	37,260	91,900	24%	321
Lincoln	437	3,728	4,740	19	40	3,709	4,700	127	10.75
Logan	456	13,754	15,390(C)	6,101	6,787	7,653	11,603	66	25.5
Mason	446	6,817	8,130	194	200	6,623	7,930	120	17.8
Mingo	424	7,428	7,560	2,379	1,497	5,049	6,063	120	14.3
Wayne	518	10,002	11,000(B)	82	193	9,920	10,807	109	20.9
	2,567	78,989	138,720	8,775	5,717	70,214	133,003	189%	51.8

(B) Sizer reports Cabell and Wayne together at 102,900 total employment 1974. The split was based on estimates after reviewing earlier years' figures reported separately for these two counties by Sizer.

(C) Sizer reports Logan and Boone together at 22,890 total employment 1974. The split was based on estimates similar to (B) above. 7,500 to Boone.

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FACTOR 10

INDEX FOR NON-MINING EMPLOYMENT

RESA	Sq. Miles	Total Employed 1960	Total Employed 1974	Mining Employed 1960	Mining Employed 1974	Non-Mining Employed 1960	Non-Mining Employed 1974	1975% 1964 Non-Mining	1974 Non-Mining No./Sq. Miles
III									
Boone	506	6,387	7,500(D)	2,313	4,327	4,074	3,173	78%	6.3
Clay	347	2,227	1,900	0	40	2,227	1,860	83.5	5.4
Kanawha	230	82,981		3,417	3,347	79,564			
Putnam	351	6,367	104,800(E)	54	0	6,313	101,453(E)	118	175(G)
	1,434	97,962	114,200	5,784	7,714	92,178	106,486	115.5	74.3
IV									
Braxton	520	3,290	2,700	132	10	3,158	2,690	85.2	5.2
Fayette	667	13,804	13,790	2,969	1,630	10,835	12,160	112.2	18.2
Greenbrier	1,023	12,171	12,560	990	316	11,181	12,244	109.5	12
Nicholas	657	6,528	7,370	2,586	2,362	3,942	5,008	127	7.6
Pocahontas	943	2,810	2,770	292	0	2,518	2,770	110	2.9
Webster	559	2,694	2,380	413	103	2,281	2,277	99.8	4.1
	4,369	41,297	41,570	7,382	4,421	33,915	37,149	109.5	8.5

(D) Note (C)
(E) Sizer grouped total employment of Kanawha and Putnam from 1971 through 1974, with some modification or error, dealt with by judgment here.

36

FACTOR 10

INDEX FOR NON-MINING EMPLOYMENT

RESA	Sq. Miles	Total Employed 1960	Total Employed 1974	Mining Employed 1960	Mining Employed 1974	Non-Mining Employed 1960	Non-Mining Employed 1974	1975% 1964 Non-Mining	1974 Non-Mining No./Sq. Miles
V									
Calhoun	286	2,057	1,740	0	0	2,057	1,740	84.6	6.1
Jackson	472	5,121	7,120	0	0	5,121	7,121	139	15
Pleasants	135	2,167	2,720	0	0	2,167	2,720	125.5	20
Ritchie	455	3,091	2,460	0	0	3,091	2,460	79.6	5.4
Roane	486	4,054	4,280	0	0	4,054	4,280	105.6	8.8
Tyler	260	2,792	3,360	0	0	2,792	3,360	120	12.9
Wirt	234	1,215	3,000(F)	0	0	1,215	3,000	247	12.8
Wood	378	27,115	36,540(F)	1,414	0	25,701	36,540	142	96.7
	2,706	47,612	61,220	1,414	0	46,198	61,220	132.5%	22.6
VI									
Brooke	93	9,877	10,641 (x)	255	18	9,622	10,623 (x)	110 (x)	114 (x)
Hancock	89	13,893	14,209 (x)	8	0	13,885	14,209 (x)	102 (x)	160 (x)
Marshall	314	11,497	(G)	0	1,973	11,497	69,292	277	164
Ohio	109	24,997	72,100 (G)	0	835	24,997			
Wetzel	360	5,412	7,120	0	0	5,412	7,120	132	20
	965	65,576	104,070	263	2,826	65,413	101,244	155% (x)	105

(F) Sizer reports Wirt and Wood together for 1974 total employment. A split of 3,000 for Wirt and 36,540 for Wood was made for convenience based on a quick review of earlier years' figures.

(G) Sizer reports total employment for Ohio and Marshall together for 1974, and they are so grouped here.

(x) Data for 1974 missing, so Sizer's 1970 data are used for total employment and related calculations.

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FACTOR 10

INDEX FOR NON-MINING EMPLOYMENT

RESA	Sq. Miles	Total Employed 1960	Total Employed 1974	Mining Employed 1960	Mining Employed 1974	Non-Mining Employed 1960	Non-Mining Employed 1974	1975% 1964 Non-Mining	1974 Non-Mining No./Sq. Miles
VII									
Barbour	345	3,868	5,370	1,198	1,113	2,670	4,257	159	12.3
Doddridge	322	1,882	-- (H)	0	0	1,882	-- (H)	(H)	(H)
Gilmer	342	2,138	2,260	323	632	1,815	1,628	90	4.8
Harrison	418	35,214	31,750(H)	2,103	998	33,111	30,752(H)	88 (H)	41.6 (H)
Lewis	391	5,817	6,120	158	122	5,659	5,998	106	15.3
Marion	314	21,080	22,300	2,849	1,588	18,231	20,712	114	66
Monongalia	369	17,648	24,720	1,872	3,670	15,776	21,050	133	57
Preston	654	7,279	9,170	1,450	670	5,829	8,500	146	13
Randolph	1,046	7,362	9,280	693	375	6,669	8,905	133.5	8.5
Taylor	177	3,900	5,070	126	0	3,774	5,070	134	28.6
Tucker	422	2,084	2,420	135	45	1,949	2,375	122	5.6
Upshur	355	4,972	7,470	485	361	4,487	7,109	158	20
	5,155	113,244	125,930	11,392	9,574	101,852	110,356	114	22.6

(H) Sizer grouped Doddridge and Harrison for total employment, 1974. This is done here by showing the figure under only Harrison.

VIII									
Berkeley	325	11,731	24,970	0	0	11,731	24,970	136 (H)	46.5 (H)
Grant	478	2,385	3,250	0	632	2,385	2,618	110	5.5
Hampshire	641	3,509	5,060	0	0	3,509	5,060	144	7.9
Hardy	576	2,812	3,510	0	0	2,812	3,510	125	6.1
Jefferson	212	6,581		0	0	6,581	(H)	(H)	(H)
Mineral	330	6,680	8,420	37	102	6,643	8,318	125	25.2
Morgan	231	2,533	3,300	0	0	2,533	3,300	130	14.3
Pendleton	697	2,210	2,450	0	0	2,210	2,450	111	3.5
	3,490	38,441	50,960	37	734	38,404	50,226	130.8%	14.4

OBJECTIVE NUMBER 2

The project staff shall compile and analyze data obtained from each of the regions in order to identify the following:

(a) the region having the greatest need for an environmental education program, and

(b) the environmental topic or issue of greatest concern in the target region.

Part (a) of objective 2 has been completed as follows on pages 39 through 50.

Part (b) was addressed in the Linsky report as the environmental factor were weighted according to environmental concerns. Water quality and flood disasters helped to identify the region for concentration. See Linsky report pages 1 through 38.

ENVIRONMENTAL EDUCATION PROJECT

MODEL TO FIND

REGION OF LOW PROBLEM-SOLVING

ABILITY IN GRADES 4-8 AS REPRESENTED BY USING

ACHIEVEMENT SCORES AS INDICATORS

1976 - 1977 SCTP DATA

1. Gather test data for Grades 3, 6 and 9.

2. Data: Expanded standard scores -- used because they are easily converted into meaningful data.

3. Convert expanded standard scores -- by a common scale:

   Formula: Expanded standard score - National mean ÷ National standard

   Deviation = (Relative) standard deviation from the mean.

   Graph for results.

4. Consider scores used and hypothesize those making greatest contribution to student problem-solving ability and determine weighting scale for weighted scores.

   Science (5) Social Studies (4) Basic Skills (2) Reference Skills (1)

   Formula: 2(B.S.) + R.S. + 5(s) + 4(ss) = weighted score.

   Graph for results.

5. Examine for line position/region. Examine for relative change 3-6-9/region.

6. Rank regions 1-8.

7. Examine above results with student survey ranking for final selection of region to be recommended for service.

8. Do student quality control assessment by selected items from within the State/county science and social studies test.

   Graph the results for cross examination of regional ranking process. Verified.

EXPANDED STANDARD SCORES

GRADES 3, 6 and 9
SCTP - 1976-77

REGION	BASIC SKILLS (Reading, Language, Math)			REF. SKILLS			SCIENCE			SOCIAL STUDIES		
	3	6	9	3	6	9	3	6	9	3	6	9
I	333.6	450.3	530.5	389.7	488.2	548.4	385.4	481.3	533.1	390.1	479.5	563.3
II	331.5	446.2	524.02	385.7	492.2	544.4	379.6	480.0	527.5	386.2	478.3	529.7
III	348.5	467.3	537.4	404.1	516.2	559.8	398.8	498.4	543.5	400.5	500.5	545.4
IV	330.2	448.6	529.21	380.6	489.1	550.0	380.5	479.0	530.3	384.0	481.4	531.6
V	355.3	471.3	547.8	405.5	516.7	565.4	402.5	505.1	554.6	407.7	502.9	551.5
VI	352.7	477.9	559.7	410.0	523.3	586.1	400.1	509.9	562.1	403.6	506.2	564.0
VII	343.3	457.3	539.4	399.3	506.6	562.8	394.6	490.4	546.7	396.7	489.3	546.1
VIII	339.9	455.0	535.9	392.8	507.0	557.8	386.9	489.5	537.1	390.4	485.7	539.8

REGIONAL STANDARD DEVIATIONS FROM THE NATIONAL MEAN

EXPANDED STANDARD SCORE - NATIONAL MEAN ÷ NATIONAL SD = RELATIVE SD FROM MEAN

REGION	BASIC SKILLS			REFERENCE SKILLS			SCIENCE			SOCIAL STUDIES		
	3	6	9	3	6	9	3	6	9	3	6	9
I	-.047	-.107	-.138	.04	-.09	.11	-.03	-.06	-.083	.069	-.08	-.03
II	-.146	-.15	-.196	-.003	-.055	-.147	-.107	-.076	-.1359	.016	-.097	-.09
III	.088	.08	-.08	.205	.175	-.018	.138	.12	.014	.21	.15	.049
IV	-.16	-.126	-.15	-.06	-.085	-.10	-.096	-.086	-.109	-.01	-.06	-.076
V	.185	.125	.016	.22	.179	.028	.186	.196	.117	.31	.178	.10
VI	.148	.198	.12	.27	.24	.20	.155	.248	.187	.255	.215	.218
VII	.018	-.03	.058	.15	.08	.006	.085	.036	.043	.16	.026	.055
VIII	-.029	-.055	-.09	.077	.086	-.035	-.01	.027	-.0457	.07	-.015	-.002
Mean	342	460	546	386	498	562	388	487	542	385	487	540
SD	72	90	112	88	104	119	78	92	107	73	89	110

ANALYSIS OF CHANGE FACTOR GRAPH

Grade 3

1. Regions I and IV start in grade 3 below the national average with all four criteria (B.S., R.S., S., S.S.).

2. Regions I, II and IV start in grade 3 below the national average with three criteria (B.S., R.S., and science).

3. Region VIII starts in grade 3 below the national average with two criteria (B.S. and S).

4. Regions III, V, VI and VII start well above the national average.

5. Regions I, II, IV and VIII are below the national average in grade 9.

6. Region III has science and social studies above the national average.

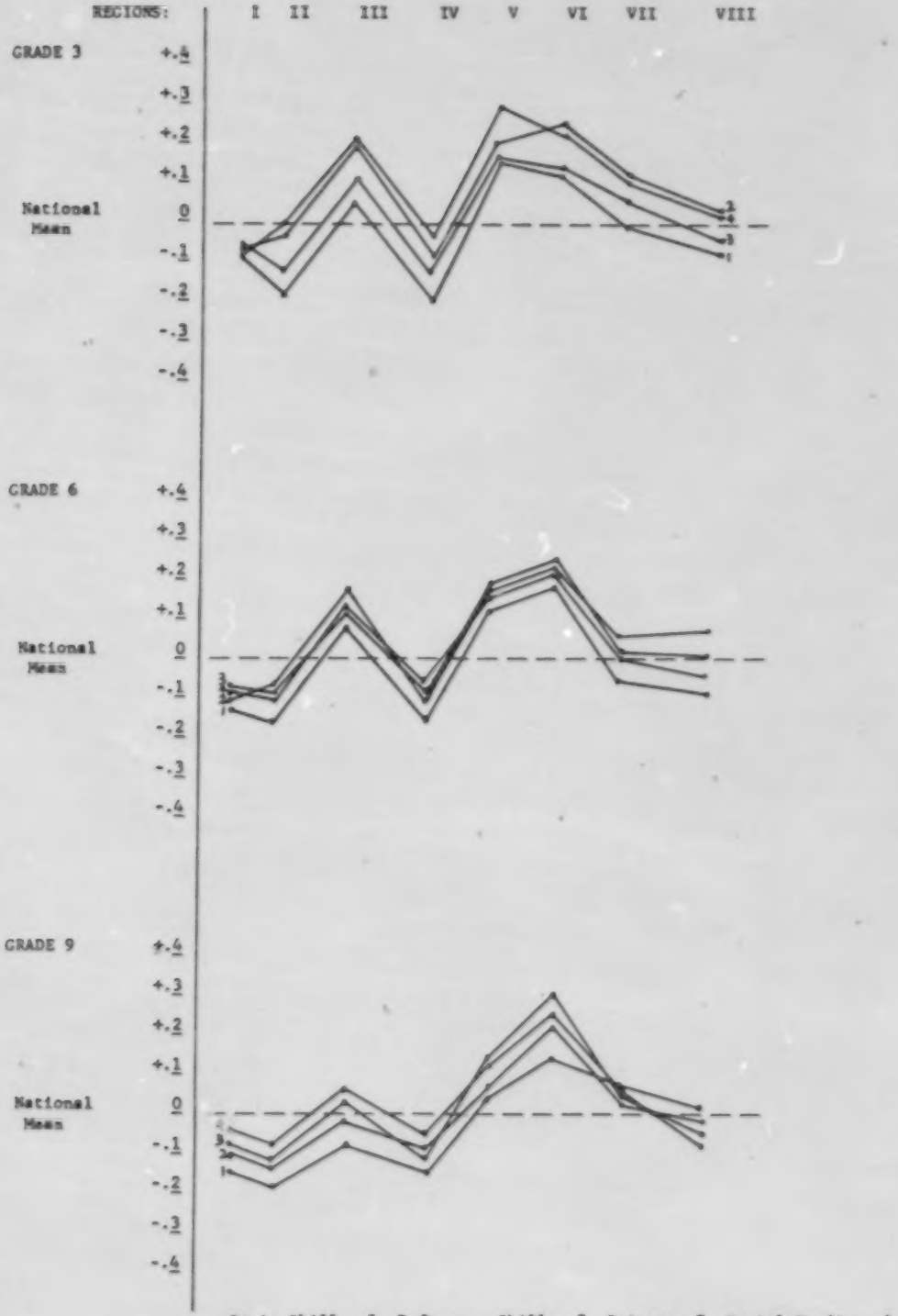
Grade 9

7. Regions V, VI and VII are above the national average.

8. Regions II, III and IV have made the most severe declines from their original position relative to the national average.

STATE-COUNTY TESTING PROGRAM RESULTS 1977

STANDARD DEVIATION FROM THE AREA



Basic Skills 1 Reference Skills 2 Science 3 Social Studies 4

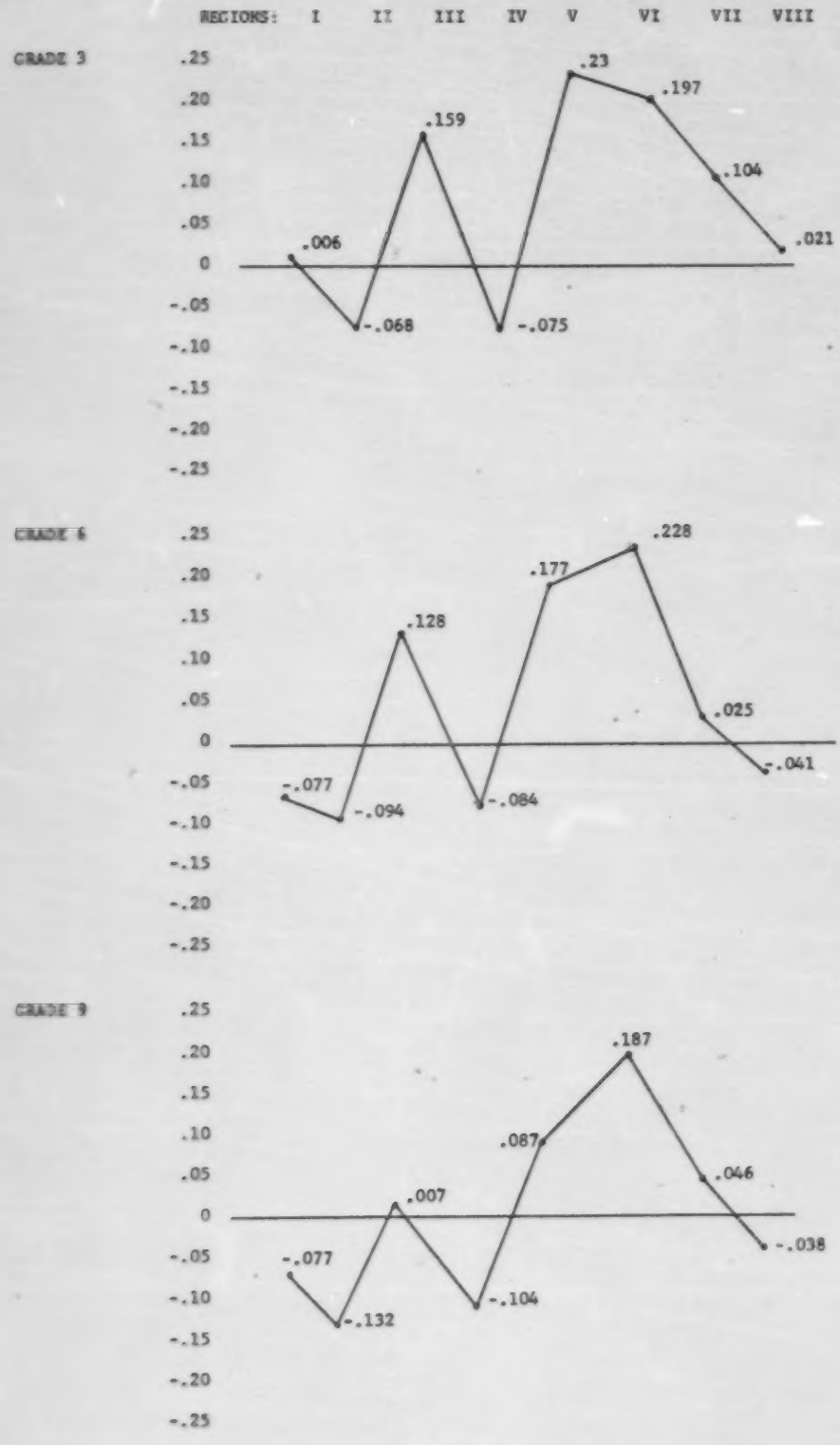
WEIGHTED SCORES = $\frac{2(B.S.) + R.S. + 5(S) + 4(SS)}{12}$

Based on SCTP 1977 Scores

GRADE 3	REGIONS I	2(-.047)	+	.04	+	5(-.03)	+	4(.069)	=	$\frac{.072}{12}$	=	.006
	II	2(-.046)	+	.003	+	5(-.107)	+	4(.016)	=	$\frac{.818}{12}$	=	.068
	III	2(.088)	+	.205	+	5(.138)	+	4(.21)	=	$\frac{1.914}{12}$	=	.159
	IV	2(-.16)	+	-.06	+	5(-.096)	+	4(-.01)	=	$\frac{.90}{12}$	=	-.075
	V	2(.185)	+	.22	+	5(.186)	+	4(.31)	=	$\frac{2.76}{12}$	=	.23
	VI	2(.148)	+	.27	+	5(.155)	+	4(.255)	=	$\frac{2.36}{12}$	=	.197
	VII	2(.018)	+	.15	+	5(.085)	+	4(.16)	=	$\frac{1.25}{12}$	=	.104
	VIII	2(-.029)	+	.077	+	5(-.01)	+	4(.07)	=	$\frac{.249}{12}$	=	.021
GRADE 6	I	2(-.107)	+	-.09	+	5(-.06)	+	4(-.08)	=	$\frac{-.924}{12}$	=	-.077
	II	2(-.15)	+	-.055	+	5(-.076)	+	4(-.097)	=	$\frac{-1.123}{12}$	=	-.094
	III	2(.08)	+	.175	+	5(.12)	+	4(.15)	=	$\frac{1.535}{12}$	=	.128
	IV	2(-.126)	+	-.085	+	5(-.086)	+	4(-.06)	=	$\frac{1.007}{12}$	=	-.084
	V	2(.125)	+	.179	+	5(.196)	+	4(.178)	=	$\frac{2.121}{12}$	=	.177
	VI	2(.198)	+	.24	+	5(.248)	+	4(.216)	=	$\frac{2.74}{12}$	=	.228
	VII	2(-.03)	+	.08	+	5(.036)	+	4(.026)	=	$\frac{.304}{12}$	=	.025
	VIII	2(-.055)	+	.086	+	5(.027)	+	4(-.015)	=	$\frac{.489}{12}$	=	-.41
GRADE 9	I	2(-.138)	+	-.11	+	5(-.083)	+	4(-.03)	=	$\frac{-.921}{12}$	=	-.077
	II	2(-.196)	+	-.147	+	5(-.136)	+	4(-.09)	=	$\frac{-1.579}{12}$	=	-.1315
	III	2(-.08)	+	-.018	+	5(.014)	+	4(.049)	=	$\frac{.088}{12}$	=	.007
	IV	2(-.15)	+	-.10	+	5(-.109)	+	4(-.076)	=	$\frac{1.249}{12}$	=	-.104
	V	2(.016)	+	.028	+	5(.177)	+	4(.10)	=	$\frac{1.045}{12}$	=	.087
	VI	2(.12)	+	.20	+	5(.187)	+	4(.218)	=	$\frac{2.245}{12}$	=	.187
	VII	2(.058)	+	.006	+	5(.043)	+	4(.055)	=	$\frac{.557}{12}$	=	.046
	VIII	2(-.09)	+	-.035	+	5(-.046)	+	4(-.002)	=	$\frac{.453}{12}$	=	-.038

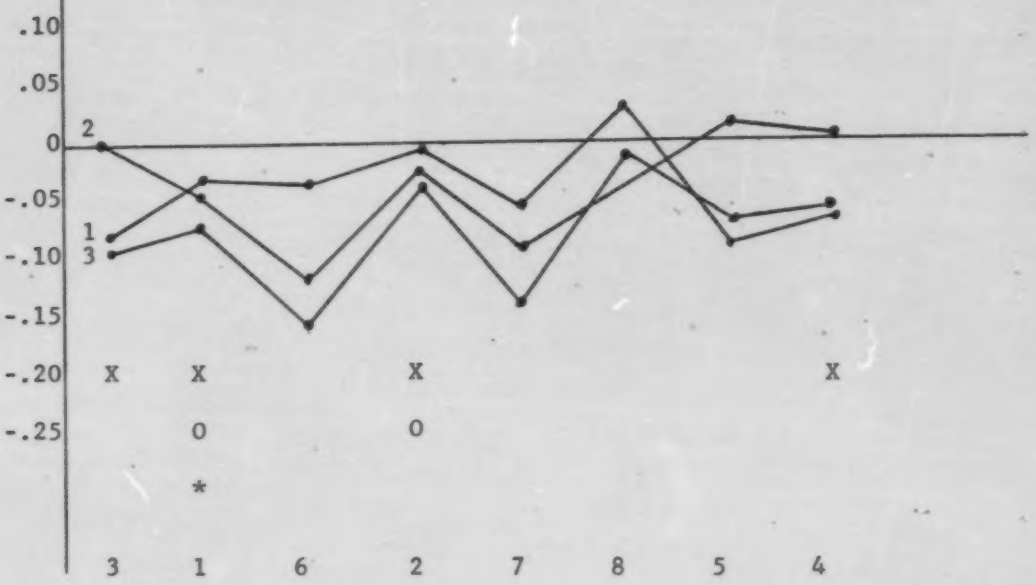
WEIGHTED SCORES = 2 (BS) + R.S. + 5(s) + 4 (ss)

BASED ON SCTP 1977 SCORES



CHANGE FACTOR OF WEIGHTED SCORES

REGIONS:	I	II	III	IV	V	VI	VII	VIII
1 - Change between 3-6	.083	.026	.031	.009	.053	+.031	.079	.062
2 - Change between 6-9	.000	.038	.121	.02	.09	.041	+.011	+.033
3 - Change between 3-9	.083	.064	.152	.029	.143	.010	.068	.059



Rank	3	1	6	2	7	8	5	4

Criteria for Selection:

1. Consider for pilot only those regions whose student weighted scores fall below the national average at the ninth-grade level (indicated by X above).

2. Concentrate first on those regions whose student scores show consistent change patterns below mean (indicated by O above).

3. Concentration on that region whose weighted student scores fall the greatest minus distance from the national average at the ninth-grade level (indicated by * above).

OBJECTIVE NUMBER 3

The project staff shall develop, validate, and administer an evaluative instrument designed to rank the problem-solving capabilities of students, grades four through eight, in each of the eight regions.

This objective has been completed by using State, County test data in grades 3, 6 and 9. Items were first selected from Science and Social Studies relative to the subject of environmental education then data drawn per item for each state region. An analysis was then made of the results. The data may be found on pages 47 through 50.

GRADE 3
SCTP - 1976-77

SCIENCE	DESCRIPTION OF ITEM	L-N/REGION I	II	III	IV	V	VI	VII	VIII	State L-N* Ave.
1 Recognition	Earth S/Zo - Time	-12	-03	02	-04	05	05	03	-04	-01
2	Earth S/Zo - Respiration	-05	-13	-04	00	-06	-05	00	-10	-05
3	Earth S/Zo - Life Cycle	-01	-04	01	-03	04	00	-01	-05	-01
4	Earth S/Zo - Erosion	00	-01	02	00	00	-01	00	01	00
5	Earth S/Zo - Fossil	-01	01	05	-01	01	02	01	02	02
6	Earth S/Zo - Living Thing	07	05	07	05	08	07	07	04	07
7 Classif.	Botany/Zo-Compare Traits	-04	-08	-03	-06	-01	-04	-03	-03	-04
8	Botany/Zo-Compare Traits	05	-03	08	01	08	09	08	07	06
9	Botany/Zo-Compare Traits	-05	-09	-05	-08	-02	-04	-04	-03	-05
10 Quantific.	Zoology - Ident.Pt.Chart	-01	-02	05	03	05	07	04	05	03
11 Interpre. of Data	Physics-Dif.Pts. on Cht.	-06	-05	-02	-07	-02	-02	-03	-07	-04
12	Earth S - Sundial Prin.	-01	-04	01	-04	03	00	00	-04	-01
13	Gen - Units of Measure	-03	-03	01	-03	03	02	01	-01	00
14 Hypothesis	Zoology-Conc.from Chart	02	-02	04	00	06	04	03	04	03
15	Ecology-Conc.from Passage	06	01	07	01	08	08	05	04	05
16	Ecology -Concl.from Cht.	-01	-04	-01	-03	02	02	-1	-01	-01
SOCIAL STUDIES										
1 Recognition	History-Prehistory records	05	02	08	03	12	07	05	02	05
2 Translation	Phys.Env.Peop.Util.of Land	10	09	13	09	15	13	12	10	11
3	Phys.Env.Phys.Geog.Rd.Map	-06	-06	-04	-07	00	-01	-01	-06	-04
4 Interpre.	Soc.Env. Peop. Interact	04	-01	05	01	05	08	06	03	04
5	Soc.Env. Peop. Interact	06	-01	07	00	06	06	06	02	04
6	Phys.Env. - Geog.	00	-03	06	-02	02	02	02	01	00
7	Phys. Env. - Utility	-01	-01	06	00	04	-01	01	-01	00
8	Phys.Env. - Adapt.	-01	-02	01	-02	02	01	02	-04	00
9 Application	Phys. Env. Prob.Solv.	00	-01	04	01	06	04	02	00	02
10 Analysis	Soc.Env.Peop.Int.Logic	02	01	04	-02	07	05	03	03	02
11	Phys.Env. Logic-Erosion	01	-01	04	-01	03	02	09	-01	02
12	Phys. Env.Logic Soil	05	-01	06	01	10	06	06	03	05
13	Phys. Env. Prob.Solv.Res.	05	04	07	03	09	05	07	03	06
14	Phys.Env. Util.Logic	07	05	10	06	04	09	08	05	08
15 History	Opinion vs. fact	-02	-02	02	-01	04	01	00	-02	00
16 Translation	History Graph Settlers	04	02	07	01	05	08	05	04	04
	Total L-N Column	19	-46	114	-19	136	105	93	4	53
	Average L-N Column	.59	-1.43	3.56	-.59	4.25	3.28	2.9	.12	1.65

*Raw score deviation from national mean

GRADE 6
SCTP - 1976-77

SCIENCE	DESCRIPTION OF ITEM	L-N/REGION I	II	III	IV	V	VI	VII	VIII	STATE L-N*
1 Recognition	Earth S-Cause Ocean Waves	-03	00	00	01	-01	-01	00	-02	-01
2	Phys.Scien.Inst.Barometer	-04	-09	-02	-04	-02	-07	-06	-04	-05
3	Ecol. Cause Tree Grow Crook.	01	-03	01	-05	10	05	02	-03	01
4	Botany-Capillary Act.	-01	-04	01	04	01	02	-02	-02	-01
5 Classif.	Physics - Potential Energy	-01	-03	-03	-01	02	-01	-01	-02	-01
6	Botany - Types of Trees	-05	-02	04	-04	06	05	-04	02	00
7 Quantif.	Zoology - Find Same Pt.	-04	-04	01	-02	03	06	02	00	00
8	Zoology - Identify Pt. Graph	-04	-02	03	-05	03	09	01	01	00
9	Chem. Ident. Pt. on Graph	00	00	02	-03	03	06	02	02	01
10 Interpre. of Data	Zoology - Developed Stage	-06	-06	00	-06	01	06	-03	-04	-03
11	Chem. Calc. from Data	-03	-01	-01	-02	00	00	-03	-04	-02
12	Earth S-Trend in Data Wind	-03	-03	-02	-04	-01	01	-03	00	-02
13 Prediction from Data	Chem. Effect Air on Fire	-01	-01	01	-04	07	05	-01	00	00
14	Physics - Balance Scale	-05	-05	03	-02	02	04	-01	00	-01
15	Earth S - Volcano Trend	-02	-02	04	-03	04	06	-01	00	01
16 Hypotheeis & Evaluation	Physics - Insuf. Inform.	-03	-04	03	-03	04	06	00	-01	00
SOCIAL STUDIES										
1 Recognition	Phys.Peop Adapt-Env.Dwell	-04	-03	04	-05	02	02	00	00	00
2	History-Settlement migration	-03	-04	03	-01	02	01	-02	-03	-01
3	Pol/Econ Env-Syst.of Price	-05	-06	01	-05	03	05	-01	-03	-02
4	Social Env-Grps - Val & Conf	-01	00	03	02	09	06	04	05	03
5	Peop Interact-Learn Family	-03	-03	02	-05	05	04	00	-01	00
6	Soc.Syst-Change Family Role	-01	02	05	00	09	09	07	02	04
7	Soc.Syst-Comp. Nat'l Life St	-06	-07	00	-04	02	05	-01	-02	-02
8	Grps.Interact-Ind/	01	-03	06	00	05	04	02	-01	02
9 Translation	Physical Env-Geog.Top/Clim.	-05	-07	-01	-03	-04	04	-04	-07	-04
10	Peop.Util-Graph Land Use	-03	-06	02	-02	03	05	-02	-01	-01
11	Peop.Util - Map Pop.Dens.	-05	-05	-02	-06	-01	01	-04	-02	-03
12	Peop.Util.Int. Map Key	-07	-09	-01	-08	00	03	-04	-05	-04
13 Application	Physical Env-Peop Adapt	-04	-05	-02	-04	01	00	-02	-03	-02
14 Analysis	Pol/Econ.Env.Econ Econ.System -System Prob.	01	00	06	03	07	08	04	02	04
15	Pol/Ec.Env.Pd Syst.Opin-Fact	-03	00	05	-01	08	03	01	01	02
16	Phys.Env.Peop Adapt-Geog. Irrigation	-02	-05	03	-03	04	03	-01	-04	-01
	Total L-N Column	-94	-108	49	-85	97	115	-25	-39	-18
	Average L-N Column	-2.93	-3.37	1.53	-2.65	3.03	3.59	-.78	-1.21	-.56

*Raw score deviation from national mean 48

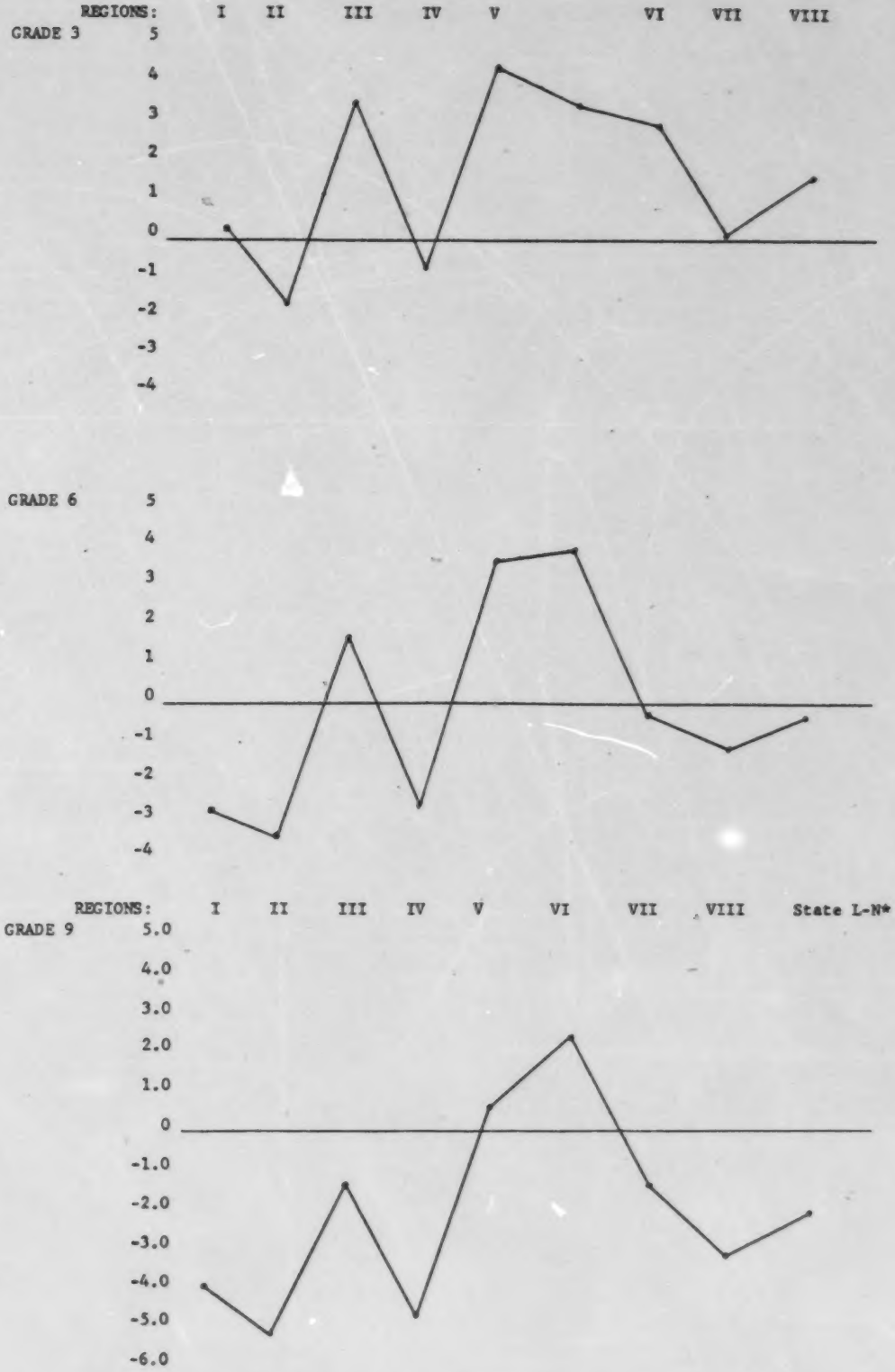
GRADE 9
SCTP - 1976-77

SCIENCE	DESCRIPTION OF ITEM	L-N/REGION I	II	III	IV	V	VI	VII	VIII	STATE L-N
1 Recognition	Phys.chng.of Energy Device	-05	-07	-05	-07	-02	-01	-03	-01	-04
2	Phys. Ident.Condens.Diag.	-03	-06	-03	-03	05	-03	-01	-04	-02
3	Earth S.Cause of Seasons	04	00	05	02	03	07	03	01	03
4 Classif.	Ecology Similarities Seeds	-04	-03	00	02	03	04	04	-03	00
5 Quantif.	Earth S.-Pts. on Topo Map	-07	-06	-03	-09	01	-03	-04	-08	-05
6	Phys.-Ident.Pts. on Graph	-02	-04	02	-02	04	08	03	03	01
7	Phys.-Read Pt.on Bar.Scale	-06	-06	-01	-06	00	03	-01	-01	-02
8 Intpre. of Data	Earth S.-Visual.land topo	-04	-04	-05	-08	-02	-01	-04	-09	-04
9	Earth S-Visual.land topo	-07	-04	00	-06	03	03	00	-05	-02
10	Earth S. Close. of lines	-03	-02	-01	-07	04	-03	00	-05	-02
11	Ecology-Info = Pond	-03	-03	01	00	03	04	01	-03	00
12	Phys.-Concl-Density -Liq.	-05	-06	-01	-02	00	-01	-03	-06	-03
13 Prediction from Data	Ecology-Outcome of trend	-02	-05	00	-03	04	07	00	01	00
14	Phys.Comparing Densities	-02	-05	-04	-04	-04	03	-01	-03	-03
15 Hypothesis & Evaluation	Ecology-Purpose Exp.-Pond	-14	-14	-06	-13	-04	04	-08	-15	-09
16	Chem.-CO_2 + Lime H_2O	-09	-10	-05	-10	-03	00	-06	-04	-06
SOCIAL STUDIES										
1 Recog.	Phys.Env-Geog.Prime Merid.	-02	-04	-04	-04	-04	00	01	-04	-02
2	Soc.Env-Lrng.from Family	01	-02	02	-01	03	09	03	04	02
3	Pol/Econ.Env-Econ-Boycott	-15	-14	-11	-13	-06	-07	-12	-12	-11
4	Pol/Ec.Env-Ec-Sup/Dmd Cost	00	-02	01	-03	05	06	02	02	01
5 Translation	Soc.Env-Soc. Syst.Trends	-02	-01	02	-02	02	07	00	-01	00
6	Phys.Env-Peop.Util.Map Smg.	01	-03	03	-02	03	07	02	02	02
7	Phys.Env-Peop.Adapt Idea Gr	-01	-04	01	-04	01	07	02	01	00
8	Pol/Ec.Dev.Ec.Graph Labor	-07	-08	-06	-07	-03	02	-04	-07	-05
9 Intpret.	Phys.Env.Peop Adapt Idea Gr	-05	-07	-02	-07	-01	00	-02	-03	-03
10 Application	Phys.Env.Peop Util-Quest Sm	-02	-06	-01	-03	01	07	00	-01	-01
11	Pol/Econ.Syst.Econ.Data	00	01	04	-02	05	07	03	04	03
12 Analysis	Soc.Env.Grp. = Prob.Solv.Sm	-02	-05	00	-04	-01	03	-01	00	-01
13	Pol/Econ-Pol-Opin.vs. Fact	-06	-06	-02	-05	01	01	-05	-06	-04
14	Econ. Opinion vs. Women	-06	-05	-01	-05	04	05	-01	-03	-02
15	Pol.- Opinion vs. Labor law	-04	-06	-02	-07	-03	02	-02	-06	-03
16	Phys. Env-Peop.Util Opinion vs. Fact Garbage	-05	-04	01	-04	04	04	-01	-03	-01
	Total L-N Column	-127	-161	-42	-149	26	83	-35	-95	-63
	Average of L-N Column Region	-3.96	-5.03	-1.31	-4.65	.81	2.59	-1.09	-2.96	-1.96

*Raw score deviation from national mean

1976-77 SCTP SCIENCE AND SOCIAL STUDIES ITEMS USED AS

INDICATORS OF E.E. COMPETENCE BY REGION - AVERAGE L-N



*Raw score deviation from national mean 50

OBJECTIVE NUMBER 4

The project staff shall develop inservice activities focusing on developing teacher competencies to meet identified needs.

This objective has been completed. Twenty teachers participated in the activities planned as shown in the workshop brochure. The workshop did address itself to the competencies developed for the workshop. The workshop brochure and competencies may be found on pages 51 through 65.

April 28, 29, 30

Friday - p.m. **Assessment**

3:00 Pre-Assessment of Teachers - World Today and Tomorrow - Some Ideas I Have
Listening Activity - Wrap Up
Beginning of Project - How and Why?
CTBS Data - Where Are We? Where Do We Want To Be?

4:00 Registration for College Credit - Expense of Participant
Workshop Orientation - Previews
Pre Test for Students

5:00 Dinner - on your own

6:00 Exemplary Activities:
Backyard Outdoor Project - Barbour County - Bill Phillips and Kenneth McDaniel
Youth Conservation Programs - Anna Griefe
Doddridge Camp Out, Etc. - Richard Beck
How Do You Get An ESEA IV-B Project?

10:00 Cabins

Saturday - a.m.

8:30 Sessions with:
8:35-9:45 Soil - Ed McNeel
9:45-10:55 Water - Bob Seymour
10:55-12:05 Forest - Richard Beck

	GROUPS	
I	III	II
II	I	III
III	II	I

p.m.

12:05 Lunch

1:05 Lesson Development - 10 Environmental Problems - Stories About Real Life Problems
Answer Book for Above
(Adaptation of morning information to participants' school - a plan for student activity by each teacher.)

4:00 Dinner

5:00 Interaction - Acceptable Alternatives
Listening Activity - Groups of 4
Film - "Cipher in the Snow"

6:00 Simulation - Council Planning
Bob and Judy Seymour

9:00 Stream Pollution - Basin Planning
Dr. Chuck Swanson - COGS
Field Trip Plans - Team Assignments

10:00 Cabins. Set your clocks ahead 1 hour.

Sunday - a.m.

6:30 Field Trip - Region II Data Collection by participants - Dr. Chuck Swanson - COGS

12:00 Back to Cabwaylingo - collection of personal belongings

At School - May 1-5
Pretest Students
Run Sample Field Activity
Prepare Statement About Sample Activity
Prepare Data About Field Trip

May 5, 6, 7

Friday - p.m.

3:00 Field Trip Data Consolidation and Presentation
Participant reports on field activity with students

5:00 Dinner

6:00 Active Listening - "Getting To The Root Of Behavior Problems"

7:00 Problem Solving Process - Activity
Dr. Joe Evans - Glenville College

10:00 Cabins

Saturday - a.m.

8:00 Problem Solving Process - Activity
Dr. Joe Evans - Glenville College

10:00 Resource Utilization - Panel Presentations
Water - Ed Goodno - U.S. Army Corps of Engineers
Soil - Paul Brant - Soil Conservation Service
Energy - Wayne Pugh - Appalachian Power
Public Decision Making - Dr. Tom Hankins - COGS

p.m.

12:00 Lunch

1:00 Sequence and Order
Robert Seymour

4:00 Dinner

5:00 Win - Win Conflict Resolution - Never Lose An Argument
Distribution of Testing Items and Discussion
Futuristics - Films

IT Environmental Workshops

Cabwaylingo State Forest

7:00 Computer Application - Energy Simulator
Dr. Robert Anderson - WVU Extension

10:00 Cabins

Sunday - a.m.

6:30 A Look At Cabwaylingo State Forest
Bill Grafton - WVU Extension - Forestry

10:00 Lesson Development - Teachers Plan A Unit For Students

— Determine date of after school workshop

12:00 Departure

At School - Implement Unit
Pretest With Cognitive and Problem Solving
Use Stories About Real Life Problems
Use Answer Book with 123 etc Best Ideas
Use other activities that you have planned

Evaluate unit prior to end of school
Cognitive - Problem-solving - Some Ideas I Have - Stories About Real Life Problems - Our World of Today and Tomorrow

Compile data on each

After school ends - attend one day workshop - Date
Bring student evaluations

Ancient Chinese Proverb
Tell Me - I Forget
Show Me - I Remember
Involve Me - I Understand

"IT

The symbol "IT" was selected for this program because 1) "IT" is a simple two-letter word representing a thing of unknown complexity, and 2) "IT" stands for individual technology - that quality within one which makes it possible to comprehend the complex changes of the world around you.

The project is funded by a grant from the U.S. Office of Education (No. G007701355).

Graduate Credit

Participants can register for three hours credit. Non-credit participants can be arranged. All participants will be expected to develop similar products tailored to their classes needs. Grades will be issued during the summer session. Renewal credit must be approved by your County Office in advance of the work.

There will be a $38.40 registration fee for persons already enrolled at Marshall University. Marshall does charge an initial enrollment fee for those not enrolled prior to the workshop. The residential costs and food will be defrayed by the project.

Information

Participants should report to the Cabwaylingo State Forest by 3:00 p.m., on the 26th day of April, 1978, for the workshop. Applicants should **bring clothing suitable for outdoor work.**

For additional information contact: Raymond Dolin, Department of Education, Capitol Complex, B-318, Charleston, WV 25305 (304) 348-2716, or Lewis Wilcox, RESA II, Curriculum Director, 2800 Fifth Avenue, Huntington, WV 25702 523-2851.

RESA II Workshop

The Environmental Education Workshop for teachers grades four through eight will be offered April 28, 29, 30, May 5, 6, 7, 1978. Also, one-half day session after school term - date to be determined by the participants.

The workshop will be conducted at the Cabwaylingo State Forest (in Region II) residential facilities where the participants will live during the workshop.

The purpose of the training session is to bring resource people and educators together to participate in a variety of environmental education activities including: Developing skills and techniques for strengthening and improving Environmental Education and provide the affective, as well as the cognitive, foundation for teachers grades four through eight.

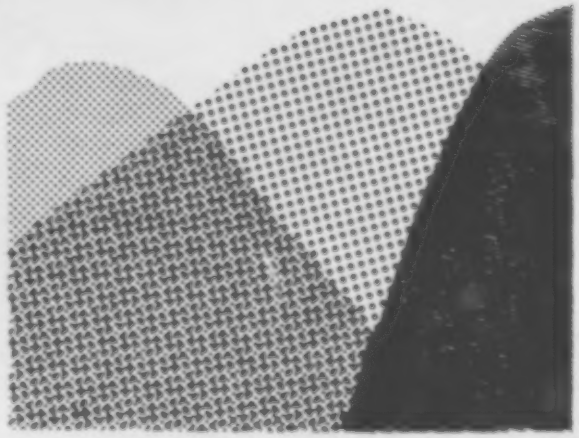
This workshop is designed so that each participant can plan a program that best meets his or her needs in environmental education. At the end of the training participants should be able to:

1. Identify his or her role in the development of the student's basic learning skills (problem-solving).
2. Develop procedures, skills and techniques for improving school involvement procedures.
3. Describe methods and procedures for maximizing individual and group participation in classroom activities.
4. Construct a correlated environmental education experience for programs within the school system.
5. Identify and describe how various environmental investigations can contribute to the student's understanding their world.
6. Identify factors and processes necessary for effective group and individual environmental problem-solving.
7. Construct lesson plans for environmental investigations to use in the classroom.
8. Develop activities for classroom use which provide variety and depth to the student's understanding of the world in which he lives.
9. Organize the use of local resources (people, places, materials) in the expansion of the learning environment to meet the needs of the students.
10. Facilitate the infusion of sound educational practices and environmental concepts into the total curriculum.

Participants can expect a minimum of classroom "lecture-type" activities and a maximum of direct "hands-on" activities.

Environmental Education Is IT*

Middle School Environmental Education Project 1977 - 1978



WEST VIRGINIA DEPARTMENT OF EDUCATION

CONCEPT	ESSENTIAL COMPETENCY	LEARNER OUTCOMES	SUGGESTED ACTIVITY
1.0 Information Acquisition	1.1 The learner will demonstrate the ability to use direct observation to acquire information.	1.1.1 Given a series of objects, the learner will through use of the various senses describe shapes, textures, odors, etc. of the objects in terms of the information received by the senses.	1. Take class on field trip to various environmental areas and have students to observe everything they can about each area using their senses. Observation can be recorded on site or summarized at the conclusion of the trip. A. Take the class on a field trip to a creek and have them to list everything about the creek that they can be using only their senses. B. Other activities found in the Environmental Education Activity Guide (s) available free through the West Virginia Department of Education: Secondary guide: Unit 1 Balance of Nature-page 2 Unit IV Air Pollution-page 4 Intermediate guide: Grass Community-page 23 Noise-page 9 Primary guide: Page 10 2. Using appropriate classroom materials the learner will make observation using his/her senses. A. Use a sock filled with objects to guess--or use a "Feely Box." B. Other activities found in the Environmental Education Activity Guide (s) available free through the West Virginia Department of Education:

CONCEPT	ESSENTIAL COMPETENCY	LEARNER OUTCOMES	SUGGESTED ACTIVITY
(1.0 Continued) Information Acquisition	(1.1 Continued) The learner will demonstrate the ability to use direct observation to acquire information.	(1.1.1 Continued) Given a series of objects, the learner will through use of the various senses describe shapes, textures, odors, etc. of the objects in terms of the information received by the senses.	Secondary guide: Unit III Water Pollution-page 5 Intermediate guide: The Grass Community-page 23 The Mystery Box-page 18 Primary guide: Page 3
	1.2 The learner will demonstrate the ability to use questioning techniques as a means of acquiring information.	1.2.1 Given a real life situation about which specific information is needed, the learner will devise 10 questions to obtain wanted information.	1. Have learner to prepare questions to gain additional knowledge of topic under consideration. A. Take class on field trip to a sewage treatment plant. Prior to departure have learner prepare a list of questions on the operation of the plant. B. Take class on field trip to forest where learner might ask questions about size, shape, smell, etc. of objects. C. Other activities found in the Environmental Education Activity Guide (s) available free through the West Virginia Department of Education: Secondary guide: Unit III Water Pollution-page 2 Intermediate guide: The Grass Community-page 23 Pioneer Study-page 50 Primary guide: Page 25

CONCEPT	ESSENTIAL COMPETENCY	LEARNER OUTCOMES	SUGGESTED ACTIVITY
(1.0 Continued) Information Acquisition	1.3 The learner will demonstrate the ability to use prepared sources as a way of acquiring information.	1.3.1 Given hypothetical problems to solve, the learner will show a growing capacity to use increasingly abstract media as a source of information as questions.	1. Given learner a variety of resource materials and ask them to solve a specific problem using these resource materials. A. With proper reference materials available, have the class draw up plans for a sanitary landfill. B. Other activities found in the Environmental Education Activity Guide (s) available free through the West Virginia Department of Education: Secondary guide: Part II-page 10 Part IV-page 5 Intermediate guide: Air-page 38 Population-page 44 Primary guide: Page 9 Page 23
		1.3.2 Given problems to solve, the learner will demonstrate a growing capacity to use media that contain an increasingly larger number of variables by location, recording and reporting his/her findings.	1. Given a topic, the learner will use reference guides to select appropriate media to solve a task. Given increasingly complex tasks the learner will demonstrate a growing capacity to select and use the appropriate media. A. Given a topic the learner is to find sources for his topic such as the Reader's Guide. B. The learner will be given a topic and told that sources other than books and magazines must be used.

CONCEPT	ESSENTIAL COMPETENCY	LEARNER OUTCOMES	SUGGESTED ACTIVITY
(1.0 Continued) Information Acquisition	(1.3 Continued) The learner will demonstrate the ability to use prepared sources as a way of acquiring information.	(1.3.2 Continued) Given problems to solve, the learner will demonstrate a growing capacity to use media that contain an increasingly larger number of variables by location, recording and reporting his/her findings.	C. Other activities found in the Environmental Education Activity Guide (s) available free through the West Virginia Department of Education: Secondary guide: Population-page 1 Air Pollution-pages 1 and 2 Intermediate guide: Air-page 38 Population-page 44

CONCEPT	ESSENTIAL COMPETENCY	LEARNER OUTCOMES	SUGGESTED ACTIVITY
2.0 Information-Processing Skills	2.1 The learner will demonstrate the ability to make comparisons.	2.1.1 Given two or more similar situations (two children, two families), the learner will compare their attributes.	1. Given two different sets of information or samples, the learner will be asked to compare their similarities and differences. A. The learner will be given pictures or mounted specimens of a moth and a butterfly and asked to note the similarities and differences in their structures. B. The learner will be given information on two pools of water and asked to compare their similarities and differences. C. The learner will be asked to compare the amount of natural resources used by a family in the U.S. per day with that of a Japanese family. D. Other activities found in the Environmental Education Activity Guide (s) available free through the West Virginia Department of Education: Secondary guide: Unit III Water Pollution-page 8 Unit V Thermal Pollution-page 2 Intermediate guide: Fresh Water Community-page 9 Forest Adaptation-page 21 Primary guide: Page 28 Page 38

CONCEPT	ESSENTIAL COMPETENCY	LEARNER OUTCOMES	SUGGESTED ACTIVITY
(2.0 Continued) Information-Processing Skills	(2.1 Continued) The learner will demonstrate the ability to make comparisons.	2.1.2 Given a specific situation (technology, people, environment), the learner will note changes over a given time period.	1. The learner will make observations and collect data over an extended period of time noting trends or changes if any. A. Do environmental study of places (before and after) which have been strip-mined. B. The learner will collect data over an eight month period noting seasonal and other changes in plant and animal life on the school campus. C. Other activities found in the Environmental Education Activity Guide (s) available fr through the West Virginia Department of Education: Secondary guide: Unit II Population-page 10 Unit III Water Pollution-page 6 Intermediate guide: Fresh Water Community-page 11 Solid Waste-page 41 Primary guide: Page 56 Page 60
	2.2 The learner will demonstrate the ability to classify information according to selected criteria.	2.2.1 Given information (a set of pictures, tools), the learner will group and label the information based on noted similarities and differences.	1. The learner will classify given information or specimens using noted similarities and differences. A. Have learner collect flowers and classify them using criteria of his/her own choosi B. Have learner classify trees using leaves bark, or twigs. C. Other activities found in the Environment. Education Activity Guide (s) available fr through the West Virginia Department of Education:

CONCEPT	ESSENTIAL COMPETENCY	LEARNER OUTCOMES	SUGGESTED ACTIVITY
(2.0 Continued) Information-Processing Skills	(2.2 Continued) The learner will demonstrate the ability to classify information according to selected criteria.	(2.2.1 Continued) Given information (a set of pictures, tools), the learner will group the label the information based on noted similarities and differences.	Secondary guide: Unit VIII Renewable and Non-renewable Natural Resources-page 2 Intermediate guide: Constructing a Social Community-page 2 Forest Adaptation-page 21 Primary guide: Page 41 Page 46
		2.2.2 Given a specific set of information, the learner will arrange the items along a continuum (situations from most to least information, historical events by time etc.).	1. The learner, when given a set of information about a topic, will arrange the events along and appropriate continuum. A. The learner is given a set of information about the life of a tree and is able to group the events according to sequence. B. Give clouds, the ocean, large medium and small rivers, the learner will arrange them in sequence showing the water cycle. C. Given photographs of various stages of succession the learner will arrange in the correct sequence. D. Other activities found in the Environmental Education Activity Guide (s) availabe free through the West Virginia Department of Education: Secondary guide: Unit II Population-page 2 Intermediate guide: Grass Community-page 25 Chains and Webs of Interdependency-page 5 Primary guide: Page 46 Page 54

CONCEPT	ESSENTIAL COMPETENCY	LEARNER OUTCOMES	SUGGESTED ACTIVITY
(2.0 Continued) Information-Processing Skills	2.3 The learner will demonstrate the ability to go beyond information that is given and report the inferences that are implied.	2.3.1 After beign presented with information, the learner will identify both facts and inferences and will distinquish facts from inferences that are based on facts.	1. Given a set of information, the learner will discern facts from inferences. A. The learner will determine which ideas are facts and which are inferences by regarding observations made on a piece of wood. B. After being told about the effects of stripmining on land and animals that live in the area, the learner will determine which are facts and which are inferences. C. After studying population cycles of wildlife, the learner will determine fact from inference about hunting to reduce numbers. D. Other activities found in the Environmental Education Activity Guide (s) available free through the West Virginia Department of Education: Secondary guide: Unit IV Air Pollution-page 5 Intermediate guide: Forest Community-page 12 What Is a Tree-page 16 Primary guide: Page 41 Page 47
	2.4 The learner will demonstrate a growing capacity to develop hypotheses that are testable.	2.4.1 Given a situation, the learner will generate logical inferences and identify evidence on which inferences are based.	1. From a specific experiment or data collection the learner will generate inferences or hypotheses. A. The learner is given a set of information about an experiment in soil testing and is able to decide which vegetables will actually grow well in each section of the garden and what sections need what for each vegetable to be planted there.

CONCEPT	ESSENTIAL COMPETENCY	LEARNER OUTCOMES	SUGGESTED ACTIVITY
(2.0 Continued) Information-Processing Skills	(2.4 Continued) The learner will demonstrate a growing capacity to develop hypotheses that are testable.	(2.4.1 Continued) Given a situation, the learner will generate logical inferences and identify evidence on which inferences are based. 2.4.2 Given information on a topic, the learner will formulate hypotheses on the basis of the evidence presented.	B. The learner will generate logical references about a piece of wood which he/she has observed. C. After looking at the pH of water and given a chart of life in a stream, the learner is able to hypothesize what kind of living matter he/she will find there. D. The learner will develop hypotheses to why the growth rings are sometimes wider on one side of the tree than on the other side. E. Other activites found in the Environmental Education Activity Guide (s) available free through the West Virginia Department of Education: Secondary guide: Unit II Population-page 15 Unit VII Renewable and Non-renewable Natural Resources-page 5 and 6 Intermediate guide: Forest Community-page 12 What Is a Tree-page 16 Soil-page 48 Primary guide: Page 25 Page 26 Page 28 Page 41 Page 47

CONCEPT	ESSENTIAL COMPETENCY	LEARNER OUTCOMES	SUGGESTED ACTIVITY
(2.0 Continued) Information-Processing Skills	2.5 The learner will demonstrate a growing capacity to use his/her imagination in proposing alternatives.	2.5.1 Given a situation (such as conflict between groups), the learners will describe their feelings as imaginary partcipants in the situation.	1. The learner will be asked to describe his/her feelings regarding a conflict situation after being assigned a position either pro or con. A. The learner will defend his/her position on a subject he/she is adamant about--only he/she must defent the other point of view. Such as--he/she is anti-strip-mining but he/she must present evidence for stripping. B. Separate the class into two groups. Let one be for strip-mining and the other against it. C. Other activities found in the Environmental Education Activity Guide (s) available free through the West Virginia Department of Education: Secondary guide: Unit I Balance of Nature-page 3 Unit VIII Noise Pollution-page 6 Intermediate guide: Constructing a Social Community-page 2 Population-page 43 Primary guide: Page 37
	2.6 The learner will demonstrate a growing capacity for evaluative thought.	2.6.1 Given a situation requiring a choice, the learner will explore alternatives and make a choice on the basis of criteria that he/she can defend.	1. Given a conflict situation, the learner will make a choice and defend his/her position. A. Given a list of data about each vacation spot, the learner must choose the best spot. B. Other activities found in the Environmental Education Activity Guide (s) available free through the West Virginia Department of Education:

CONCEPT	ESSENTIAL COMPETENCY	LEARNER OUTCOMES	SUGGESTED ACTIVITY
(2.0 Continued) Information-Processing Skills	(2.6 Continued) The learner will demonstrate a growing capacity for evaluative thought.	(2.6.1 Continued) Given a situation requiring a choice, the learner will explore alternatives and make a choice on the basis of criteria that he/she can defend.	Secondary guide: Unit I Balance of Nature-page 3 Unit VIII Noise Pollution-page 6 Intermediate guide: Population-page 43 Soil-page 47 Primary guide: Page 43 Page 57

CONCEPT	ESSINTIAL COMPETENCY	LEARNER OUTCOMES	SUGGESTED ACTIVITY
3.0 Self-Management	3.1 The learner will demonstrate increasing concern for individuals and their surrounding society.	3.1.1 Given a problem situation, the learner will recognize the existence of varying perspectives by those concerned with the problem.	1. The learner will be asked to recognize the concerns of others as they pertain to conflict situations. A. Faced with the prospect of tearing down the hometown school and building a consolidated ultra-modern school, the learner must look at all aspects of the situation. B. Other activities found in the Environmental Education Activity Guide (s) available free through the West Virginia Department of Education: Secondary guide: Unit II Population-page 16 Intermediate guide: Population-page 43 Soil-page 47 Primary guide: Page 57 and 58 Page 61
	3.2 The learner will demonstrate constructive attitudes toward diversity.	3.2.1 Given examples of diverse situations, the learner will defend or promote desirable differences and condemn or reduce undesirable differences.	1. The learner will recognize that there are differences of opinion in a conflict situation and will learn to promote those which are desirable and reduce those which are undesirable. A. Faced with the prospect of the tearing down of the hometown school and the building of a consolidated ultra-modern school, the learner must look at all aspects of the situation. Out of this survey the learner chooses the good points and defends them and denounces the bad points.

CONCEPT	ESSENTIAL COMPETENCY	LEARNER OUTCOMES	SUGGESTED ACTIVITY
(3.0 Continued) Self-Management	(3.2 Continued) The learner will demonstrate constructive attitudes toward diversity.	(3.2.1 Continued) Given examples of diverse situations, the learner will defend or promote desirable differences and condemn or reduce undesirable differences.	B. Other activities found in the Environmental Education Activity Guide (s) available free through the West Virginia Department of Education: Secondary guide: Unit I Balance in Nature-page 13 Intermediate guide: Water-page 46 Population-page 44
		3.2.2 Given a list of things, situations, etc., the learner will select those items that are examples of inevitable or natural change.	1. The learner will be asked to discern between changes which are natural and those which are man-made. A. The learner will be given the history of an area and must list things that have affected it--whether natural or man-made. B. The learner must choose from a list of things at a picnic area (such as tin cans on the ground; trees hit by lightning), those things which are inevitable or change naturally. C. Other activities found in the Environmental Education Activity Guide (s) available free through the West Virginia Department of Education: Secondary guide: Unit I Balance in Nature-page 9 Intermediate guide: Fresh Water Community-page 9 and 10 Forest Community-page 12 Primary guide: Page 45

CONCEPT	ESSENTIAL COMPETENCY	LEARNER OUTCOMES	SUGGESTED ACTIVITY
(3.0 Continued) Self-Management	(3.2 Continued) The learner will demonstrate constructive attitudes toward diversity.	3.2.3 Given a problem situation in the school or community, the learner will promote desirable change and condemn undesirable change.	1. The learner will be asked to develop strategy to promote desirable change and condemn undesirable change in a school or community. A. The learner must change the "anti-new schoolists" minds about a new building. B. Litter--how can it be prevented? C. Other activities found in the Environmental Education Activity Guide (s) available free through the West Virginia Department of Education: Secondary guide: Unit III Water Pollution-page 11 Intermediate guide: Population-page 43 Water-page 46
		3.2.4 Given two different situations affected by a similar change, the learner will compare the ramification of each.	1. The learner will be asked to compare the effects on two different situations being acted upon by a similar change. A. The learner must examine the problems involved in a strip-mine operation near a fishing resort and one near a farm area. B. Other activities found in the Environmental Education Activity Guide (s) available free through the West Virginia Department of Education: Intermediate guide: Soil-page 48 Population-page 44 Primary guide: Page 28

CONCEPT	ESSENTIAL COMPETENCY	LEARNER OUTCOMES	SUGGESTED ACTIVITY
(3.0 Continued) Self-Management	3.3 The learner will develop constructive attitudes toward conflict.	3.3.1 In discussing a specific conflict, the learner will suggest alternative ways of settling conflict.	1. The learner will learn that there are alternatives for settling conflict situations. A. The PTA wants to spend $2,000.00 for the school. Some want to buy new musical instruments and some want to set up a learning center outside. The learner must find a constructive way to resolve this situation. B. Give the learner a problem to solve such as whether to use a one-acre-lot for a home for the old people or as an apartment for young married couples. He/she will give positive and negative points for each one and then let the class vote to see what they will do with the land. C. Other activities found in the Environmental Education Activity Guide (s) available free through the West Virginia Department of Education: Secondary guide: Unit I Balance in Nature-page 3 Intermediate guide: Soil-page 48 Population-page 44
		3.3.2 After discussing the alternative ways of settling a dispute, the learner will compare the positive and negative aspects of each.	1. The learner will learn that there are good and bad alternatives for settling conflict. A. Referring to suggested activity, 3.3.1 A on the previous competency, the learner is to decide what is good and bad about each way of spending the money. B. Referring to suggested activity 3.3.1 B on the previous competency, the learner is to compare the positive and negative aspects of settling the dispute.

OBJECTIVE NUMBER 5

The project staff shall conduct inservice sessions and summer workshops to enable teachers to develop.

(a) a knowledge base for formulating lessons relevant to the identified environmental issue,

(b) a conceptual framework for environmental concepts,

(c) a conceptual framework of the systematic development of culture and technology,

(d) a format for enriching their current instruction with environmental problem-solving instruction, and

(e) an evaluative tool for their own analysis of the mode of instruction developed during the project.

This objective has been completed. Teachers have responded to activities completed as a result of the workshop that represent each part of this objective have been met. The teacher comments are found on pages 66 through 80.

Part (e) was met by a problem solving instrument and a cognitive factors instrument developed for the project. These instruments are found on pages 81 through 90.

Evaluation of the success of this session will be the product of two surveys. First, a subjective analysis of teacher participation, materials developed and enthusiasm for problem-solving instruction will be used. Participation responses to this questionnaire will serve as the second portion of the evaluation.

PARTICIPANT QUESTIONNAIRE

1. Indicate the degree to which these experiences have been worthwhile for you.

   1 2 3 4 5 6 7 8 9 10
   Least Most

2. What was worthwhile?

3. Indicate the degree to which you felt personally involved in the learning process.

   1 2 3 4 5 6 7 8 9 10
   Least Most

4. What helped you to be involved?

5. What kept you from being involved?
   How long did it?
   What did you do to overcome it?

6. Indicate the degree to which the things you learned will be useful in your classroom.

   1 2 3 4 5 6 7 8 9 10
   Least Most

7. What will be useful?

8. List three group involvement techniques you learned here that will be useful to you back home.

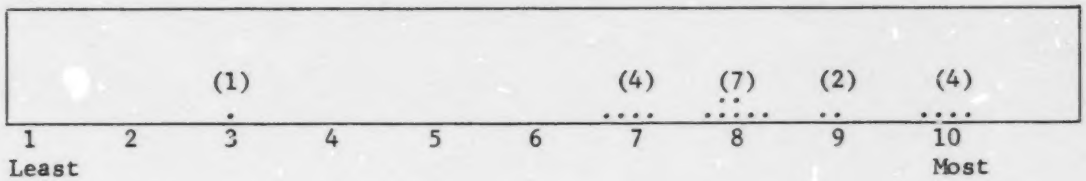
9. What type of follow-up assistance would you like to better accomplish your role and that of your school in Environmental Education?

10. General Comments on:

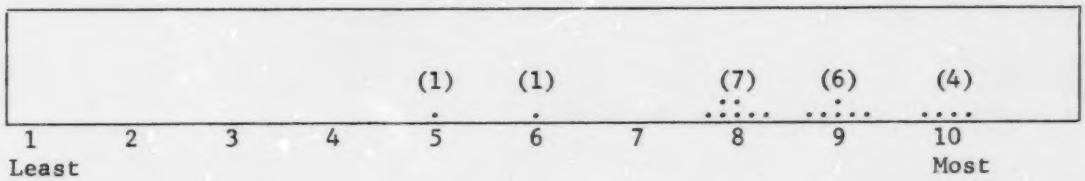
    Organization:
    Instructional Techniques:
    Content:
    Other:

CABWAYLINGO 1978
SUMMARY OF TEACHER RESPONSE

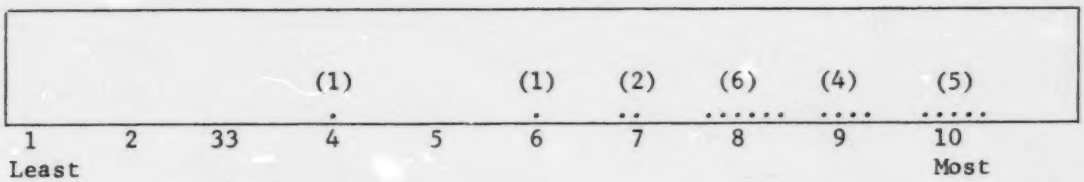
Item 1: Indicate the degree to which this training conference has been worthwhile for you.



Item 3: Indicate the degree to which you felt personally involved in the learning process at this training conference.



Item 6: Indicate the degree to which the things you learned at this training conference will be useful in your job.



CABWAYLINGO 1978
SUMMARY OF TEACHER RESPONSE

ITEM 2: What was worthwhile?

1. The outside Activities (soil, water, and forest) - Session on problem solving techniques.

2. Methods learned, the information received, and it was just a genual uplift to the normal routine.

3. Being able to be involved.

4. Field trips, practical application, group involvement.

5. Became more aware of our surrounding and how they can help us in doing a better job teaching.

6. Field experiences and some of the speakers.

7. Nature study, problem solving.

8. Cabwaylingo field trip, discussion on problem solving, and different plans and ideas of other people.

9. Field work (except for the sewage plant).

10. The field trips; the tests we ran on soil, water; the tree workshop; the viewing of what other schools are doing in this area; meeting other teachers; learning things I didn't know.

11. The individual learning experiences with trees, water, and soil - Interaction among participant and instructors.

12. Making me more conscious of how I can work the environment into my own field.

13. Examining what I have been doing and proposing alternatives, ways to approach the subject.

14. Focus on problem solving and dealing with problems.

15. Environmental awareness, general information, and task cards as means to problem-solving.

16. Tieing together the different disciplines for the improvement of the environment.

17. Learning or becoming more aware of my environment. Learning about soil, water and forestry. The field trips, especially the one on nature.

ITEM 4: What helped you to be involved?

1. Atmosphere and type of people being involved-friendliness and acceptance of the thoughts of others.

2. The instructors. The common purpose shared by all. The other participants.

3. The activities.

4. Good group interaction and leadership.

5. Type of group activities that we had to do.

6. Instructors--degree of knowing others.

7. Activities, and got to know everyone.

8. Friendly participants, good leadership, and mostly good speakers.

9. Activities.

10. Easy going-manner

11. Group activities.

12. Friendliness of everyone including instructors; the attitude that here was something important we needed to know and we're here to learn it the best way; interaction among participants.

13. Speaking out; knowing whatever was said was a respected answer.

14. By willingly cooperating in the suggested activities in most cases being tired.

15. The atmosphere of the group was get involved. The leaders stressed this and let us make our own decision.

16. Interaction with others.

17. Groups of (4) and you talked about yourself--exchanged ideas.

18. The friendly atmosphere.

19. The topics involved, the two instructors (Ray Dolin & Bob Seymour) the different teachers, all the important speakers on various topics.

ITEM 5:

What kept you from being involved?	How long did it?	What did you do to overcome it?
1. lack of sleep	last day of each week	nothing
2. myself	not long	made up my mind to get involved.
3. myself		got involved
4. meeting new people, strain, and tension	1 1/2 days	I tried to liven things up.
5. nothing		
6. being cold, tired or sick	as long as symptoms lasted	get warm, sleep or feel better
7. nothing		
8. nothing	none	nothing
9.	long lectures	tried to stay awake kept telling myself . f would soon be over.
10. not knowing everyone	not long (1 evening)	talked to others
11. nothing		
12. being tired		
13. Some things were a little elementary.	10 sec.	I am basically a person who sits back, observes, and take mental notes.
14. Feeling of not knowing correct answers.	short while	Disregarded it.
15. newness, unfamilarity, and weekend		time, group activities, and self-confidence
16. shyness	1st day	
17. nothing		

ITEM 7: What will be useful?

1. Some of problem solving techniques and field trips.
2. Methods, materials, and problem solving techniques.
3. Being able to take the kids out of doors and feel comfortable in discussing ideas concerning water, trees, nature, etc.
4. Factual information, H^2O knowledge, soil sampling, and flora identification
5. Field trips - How to find out information - get students involved in class - problem solving
6. Nature study, involving students in activities, problem solving.
7. How to test tree's, soil and water. Knowledge that I had never known before I can understand and relate to others.
8. Teach environmental education and the problem solving process.
9. Things learned from field activity.
10. The feeling I acquired for my surroundings.
11. Knowledge of curriculum content; resource persons; resources (books, pamphlets, etc.).
12. Familiarity with water, soil kits etc. Ability to transfer my learning to my students.
13. The background information that I have stored up for future use.
14. The materials and the determination to give individual attention and get the student involved.
15. Focus on problem and dealing with them in a systematic way.
16. Lesson plans - took cards - group involvement - techniques - investigation method.
17. The hands on approach, involving the students.
18. Field experience.

ITEM 8: List three group involvement techniques you learned here that will be useful to you back home.

1.	2.	3.
questions	role play	problem solving techniques.
role playing	communication	questioning techniques
different types of questions to ask.	active listening	sharing ideas-giving ideas
soil testing	water testing	matching parts to join square-science
nature walks	problem solving methods	gaining information about the area we live in
working together as groups	working outside	problem solving activities
how to bring about question and discussion	problem group solving techniques	learn by doing
group discussions	role playing	simulation games
observation in the field	role playing	
nature walks (4) problem solving	soil examinations	water testing
how to lead discussions	how to develop lesson plan	problem solving
allowing children to do instead of watch	ask questions which allow all children to be correct	allow students to choose problem area with which they wish to work
interaction with group members, impressions everyone gives on others in groups	dividing into small groups to collect data instead of alone	working together as a group without communicating in the usual manner
game playing	data gathering	group work
questioning techniques	simulations	group projects
open ended questions	focusing	types of questions to ask memory recall etc.

ITEM 8:

1.	2.	3.
role playing	group inference	field trip
the nature tour	soil experiment	water experiment
hike	forest and soil	films-cipher sparkle

EXCERPTS FROM TEACHER EVALUATIONS OF
WORKSHOP ACTIVITIES
AND
FOLLOW-UP SCHOOL STIMULATED ACTIVITIES DONE BY STUDENTS
IN THEIR SCHOOL ENVIRONMENT

SOIL: "Soil" - Ed McNeel
"Field Trip - Region II Data Collection by Participants" - Dr. Chuck Swanson - COGS
"Soil" - Paul Brant - Soil Conservation Service

"Collected soil samples. Checked all the specimen and categorized."

"The students made a soil test from various places located on the school ground and identified the types of soil that was found. The students also checked the slope of the land from which the soil test was made."

"...saw the filmstrip on soil conservation and discussed it."

"Used soil samples from different areas of playground and community to check pH, etc."

"One day we made an outside trip to collect samples of ... soil around the school ... Then from the soil samples, we decided the type of plants to use in the soil in our area."

STREAM: "Water " - Bob Seymour
"Stream Pollution - Basin Planning" - Dr. Chuck Swanson - COGS
"Field Trip - Region II Data Collection by Participants" - Dr. Chuck Swanson - COGS
"Water" - Ed Goodno - U. S. Army Corps of Engineers

"Collected water from the right and left fork of Camp Creek. Also collected water running directly from a mine on Camp Creek. We made comparisons of the water ... The purpose was to determine the effects that mine water has on aquatic life in Camp Creek. Future goal is to check the water when the new coal mines are in operation on Camp Creek to see what effect it will have on the water."

"Collected water from the right and left fork of Camp Creek and collected water from an abandoned mine. The water was checked for the pH content and oxygen content. The purpose was to check what type of effect the water had on the aquatic life..."

"My students liked the stream study and wanted to go back again..."

"We enjoyed working with the water testing kit..."

"H_2O testing of school drinking water in the creek above and below sewage exit."

"Discussion of water, conservation, pollution, pH, and temperatures."

"Field trip to get water samples for pH tests and other Hach Kit tests."

"Discuss pH and other water factors."

"Water ... were the things mentioned in group planning that we had the equipment to deal with."

"One day we made an outside trip to collect samples of river water ... Later we compared water from the river, town, and a home well..."

FOREST: "Forest" - Richard Beck
"A Look at Cabwaylingo State Forest" - Bill Grafton - West Virginia University Extension, Forestry

"Collected ... increment borings from trees, studied plants and animal life in or on the tree. Checked all the specimen and categorized."

"... nature walks combined with art activities..."

"My students ... also liked the study of cross sections of trees and volunteered to bring in other kinds of wood ... They were eager to try the increment here also..."

"They especially enjoyed ... the pictures of a tree that they drew and colored with things they found in nature."

"Core samplings of trees around school..."

"Observed trees on playground and school area."

"Children used increment borer on school trees. Discussed age of various trees."

"Indirect measurement of height of trees."

PROBLEM SOLVING: Active Listening - "Getting to the Root of Behavior Problems"
Problem Solving Process Activity - Dr. Joe Evans, Glenville College
Interaction - Acceptable Alternatives
Listening Activity - Groups of four
Film - "Cipher in the Snow"
Sequence and Order - Robert Seymour

"Criticizing classmates."

"Active listening."

"Problem-solving work (fossilized tracks, give squares)"

Workshop Activities

ENERGY: Energy - Wayne Pugh - Appalachian Power
Computer Application - Energy Simulator - Dr. Robert Anderson, West Virginia Univeristy Extension

"...We enjoyed the energy simulator very much..."

"Unit on how much money can be saved by insulating and winterizing homes..."

"Most of my students got involved in our unit on money saved by insulating their homes."

"Energy savers workbook."

"Enjoyed working with Simon the Simulator--were talking among themselves as to which one could get Simon to go the longest."

"The students enjoyed the simulator and were really impressed by what could be stored and controlled in such a small machine. There were comments such as follows: 'Are we really running out of coal and gas? How does that machine know so much? Can we have it just for our class to work with? There were more forms of energy than I thought. How do they get all that information into the machine?'"

"Many were confused about what the simulator was all about but others found it very informative and interesting."

"To tie in activities done at Cabwaylingo, we did a unit on 'My Future Home.' First we did group planning on all the things that should be considered when planning for a home. Water, soil, and landscaping were the things mentioned in group planning that we had the equipment to deal with."

"The other largely successful activity was the use of the energy simulator with Mr. Dolin. The students were abruptly brought aware that the energy problem will definitely affect their life, and is not a problem of future generations but a problem for their generation..."

SIMULATION: Simulation - Council Planning - Bob and Judy Seymour
Win - Win Conflict Resolution - Never Lose an Argument
Futuristics - Films

"Possible use of strip of land (Newton)"

"Role playing (plans for picnic)"

"Simulation work"

COLLECTIONS, FIELD TRIPS, OUTDOOR ACTIVITIES: Field Trip Data Consolidation and Presentation - Participation Reports on Field Activity with Students
Backyard Outdoor Project - Barbour County - Bill Phillips and Kenneth McDaniels
Youth Conservation Programs - Anna Griefe
Doddridge Camp Out, Etc. - Richard Beck

"Field trip to study what animals lived in the area. List and compile list."

"Second field trip studying plant life - collect specimen to study in classroom."

"...The first day we discussed collecting leaves around our school ... The second day we collected leaves from about twenty different trees. The third and fourth days we associated the leaves with their respective trees. On the fifth day, we had a practical test in which the students identified the trees by their leaves."

"...Many of the children made wild flowers and other types of collections..."

"...Dendrochronology, sounds of nature - and listening activity."

"Tracks"

"Students will be given materials to make one greenhouse to specific measurements on instruction sheet. Greenhouse is cut out, saran wrap is added to the square openings cut from inside of house, soil is added - plants are to begin from here. Seeds are planted in rows several inches apart after assembly - growth was tabulated. Plants began two weeks ago - from seed previously soaked. Each child was given a chart. Growth was entered at the end of each week - seed tops were noted as they changed - also noted color, size of top, shape, length - growth varied according to the type of soil and the amount of light received."

"Plant identification"

"Identified trees on playground and school area by identifying leaves."

"Observed the different parts of a tree and discussed functions of each part."

"Took pre-test and post test about trees."

"Made a leaf collection."

"Primary greenhouse activity ... Students constructed greenhouses and watered the plants charting daily growth. Weekly observations were made according to seed size change as well as soil conditions. We noted that some of the greenhouses with less windows had a harder time sprouting and took longer to germinate. Seeds were watched for a two week period. Seeds were also soaked in warm water to help promote growth."

ENVIRONMENTAL PROBLEMS: Problems - Stories About Real Life Problems (with answer books)

"Litter awareness and prevention exercise"

EXEMPLARY STATEMENTS OF TEACHERS: These following statements are statements made by some of the participants in the workshop. These statements are indictative of the total impact of the workshop and how it was used in the classroom.

--COMMENTS ON STUDENT PARTICIPATION--

"The students were very eager to participate in all the activities. The learning process did not end with the planned activities but carried over into their after school activities. Many of the children made wild flowers and other types of collections. About every day someone had something he desired to share with the class concerning our environment."

"My students liked the stream study and wanted to go back again. They also liked the study of cross sections of trees and volunteered to bring in other kinds of wood. They also volunteered to bring in soil from their gardens to be tested for pH. They were eager to try the increment here also. Most of my students got involved in our unit on money saved by insultating their homes."

"The students expressed a definite interest and really enjoyed the work that we did during this unit on environmental education. They especially enjoyed the stream study that we did, the energy simulator, and the pictures of a tree that they drew and colored with things that they found in nature."

"The students enjoyed the simulator and were really impressed by what could be stored and controlled in such as follows: 'Are we really running out of coal and gas? How does that machine know so much? Can we have it just for our class to work with? There were more forms of energy than I thought. How do they get all that information into the machine.'"

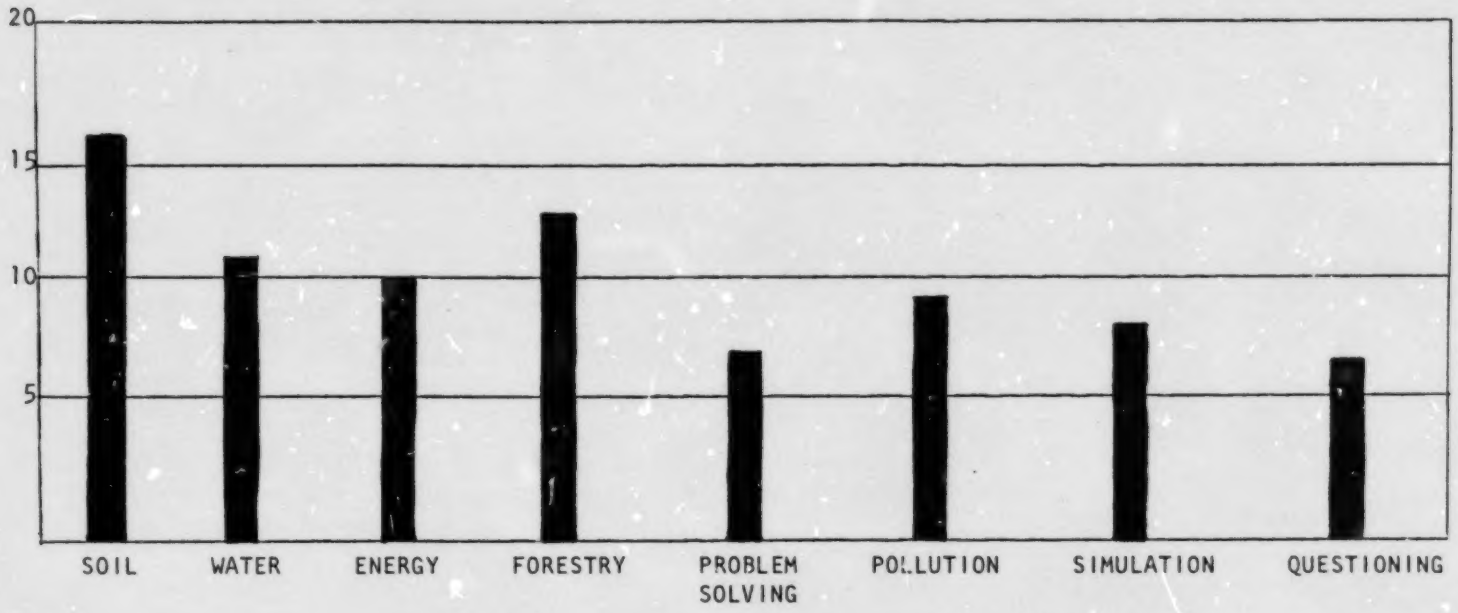
--COMMENTS REGARDING THE PILOT PROJECT--

"I feel as much time as possible should be spent in the workshop doing outdoor activities. It is much easier for a teacher to share something with his students which he has experienced himself."

"Due to this workshop and the unit we implemented at our school, we are at the present time writing a federal program to secure a $5,000 ESEA Title IV-C Grant for implementing a pilot environmental education program in two of the schools in our county."

"I thoroughly enjoyed the workshop and feel that I am a better teacher for attending. I thought the problem-solving process was a very important part of the workshop, and this should have more time. The workshop should be held early in the year in order to give teachers more time to work on their units back at school."

UTILIZATION OF WORKSHOP SUBJECT MATTER PRESENTATIONS
AS REPORTED IN FINAL TEACHER EVALUATIONS



80

INFERENCES

Teachers conducted activities which dealt with those things readily available, which had little cost associated, which needed the least amount of preparation in time and materials, and which could provide visible results.

HOW RESOURCES AFFECT EACH OTHER

This is a test of how many answers you can fill in the appropriate slots in the ten minutes after you are told to begin.

The idea is to look up and down; and across the chart. Then you write in a word that describes how the resource on the left does the action on the right to the resource at the top.

FOR EXAMPLE:

	WATER	PLANTS	WILDLIFE	MAN	SOIL	
PLANTS	rotten	roots	hiding	build	roots	STORAGE

As you can see:
-plants provide water storage in rotten logs, bark, leaves, etc.
-plants provide plants storage by holding winter food in roots.
-plants provide wildlife storage by giving them hiding places.
-plants provide man storage by providing him building materials.
-plants provide soil storage by the roots stoping erosion.

There are other equally good answers to some of these. For example plants also provide man food which contains stored energy. When your teacher says <u>begin</u> turn this paper over and begin by putting the answers above in the appropriate slots across the middle of the page.

RECEIVING AGENTS

ACTING AGENTS

	ENERGY	WATER	PLANTS	WILDLIFE	MAN	SOIL	
SOIL							TRANSPORT PRODUCE STORAGE PURITY POLLUTE CONSUME
WATER							TRANSPORT PRODUCE STORAGE PURITY POLLUTE CONSUME
PLANTS							TRANSPORT PRODUCE STORAGE PURITY POLLUTE CONSUME
WILDLIFE							TRANSPORT PRODUCE STORAGE PURITY POLLUTE CONSUME
MAN							TRANSPORT PRODUCE STORAGE PURITY POLLUTE CONSUME
ENERGY							TRANSPORT PRODUCE STORAGE PURITY POLLUTE CONSUME

RECEIVING AGENTS

ACTING AGENTS

	ENERGY	WATER	PLANTS	WILDLIFE	MAN	SOIL	
SOIL	flowing water	ground water	slips & slides	slips & slides	nomadic farmer		TRANSPORT
	erosion		food		caves - food		PRODUCE
	roots	hold run off	anchor & protect	burrows			STORAGE
		filtering	decomposition		silt		PURITY
	rivers	silt	silt		silt		POLLUTE
			mass wasting		slips & slides		CONSUME
WATER	river		floating	floating	floating	erosion	TRANSPORT
	electricity		liquid for sap	life's fluid	life's fluid	weathering	PRODUCE
	dams		nutrient				STORAGE
	chemicals		rain washes			leaching	PURITY
			flooding	drown	drown	flooding	POLLUTE
							CONSUME
PLANTS		transpiration					TRANSPORT
	food			basic food	food	decomposing	PRODUCE
	roots	hold run off		shelter	shelter	prevent erosion	STORAGE
		consume pollutants			medicines	bacteria	PURITY
	decay	crowd		toxins	weeds	crowding	POLLUTE
	sun	liquid for sap		poisonous plants	poisonous plants	using nutrients	CONSUME
WILDLIFE	disease		seed dispersal		nomadic hunter	digging	TRANSPORT
	food	burrowing	ant farming		food	decomposing	PRODUCE
					shelter		STORAGE
		crowd	pest consumption		decomp., scavenger		PURITY
	decomposing				crowding	crowding	POLLUTE
	plants	life's fluid			carnivorous		CONSUME
MAN	water	plumbing	conservation and farming	conservation and farming		construction	TRANSPORT
	fuels					decomposing	PRODUCE
		conservation					STORAGE
		filter					PURITY
	combustion	waste	waste	waste		waste	POLLUTE
	nutrients	life's fluid	necessities, lux.	hunting		poor management	CONSUME
ENERGY		waterfall		digging	power lines	slips & slides	TRANSPORT
			photosynthesis	pest control	hydro electric	nitrogen	PRODUCE
		dams	roots				STORAGE
		drinking water	oxygen				PURITY
			decomposing	waste	coal burner	silt	POLLUTE
			transpiration	plants	wildlife		CONSUME

COGNITIVE
HOW RESOURCES AFFECT EACH OTHER
STUDENTS

STUDENT RESULTS	NO. PRETEST RESPONSES	NO. POSTTEST RESPONSES	GAIN
TOTALS RESPONSES	3,078	4,091	+ 1,013

COGNITIVE
HOW RESOURCES AFFECT EACH OTHER
TEACHERS

TEACHER NUMBER	NO. PRETEST RESPONSES	NO. POSTTEST (P1) RESPONSES	GAIN P1-P	NO. POSTTEST (P2) RESPONSES	GAIN P2-P1	GAIN P2-P
TOTAL RESPONSES	546	874	318	1,065	210	519

EVALUATION OF TEST RESULTS FOR COGNITIVE:

HOW RESOURCES AFFECT EACH OTHER

The results of the evaluation instrument "Cognitive: How Resources Affect Each Other" showed an average gain of 33 percent over a two-week period in the learner's ability to understand relationships between natural processes in the physical environment. The items on the test were directly related to the curriculum presented.

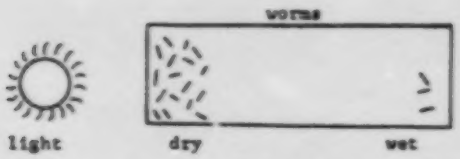
Evaluation of the results of the teacher test were:

... an increase of 60 percent was recorded from the pretest to the posttest.

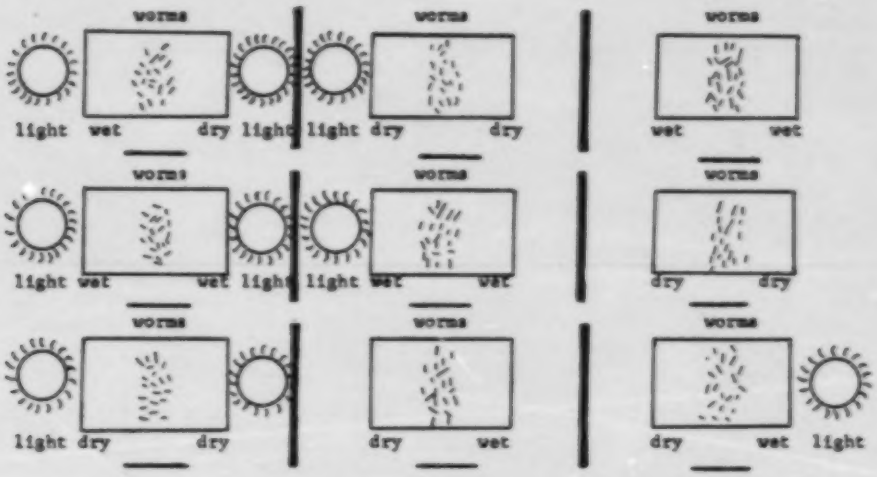
... an increase of 95 percent was recorded from the pretest to the second posttest.

Interpretation of evaluation results points out that the gain on "How Resources Affect Each Other" was recognized between the pretest and posttest. This provides evidence that the workshop material had influence on teacher understanding of relationships between natural processes in the physical environment. The gain from the first posttest to second posttest suggest that additional growth was evident due to implementation of activities for learners.

A student set up the box below and observed the behavior of worms in respect to light and moisture. She used lamps for light sources and wet pieces of paper in the boxes for moisture. In the center of the box she placed 20 worms. One day later she returned to count the number of worms that had crawled to the different ends of the box. The picture below shows you what the student observed.



She concluded that worms prefer light, dry places. Which of the following experiments should the student perform in order to test her conclusion. Place an X in the blank below any experiment that would shed additional information on the problem.



A child has been trying to grow some plants from seeds. He planted the seeds one week ago, but so far no seedlings have come through the soil. He makes two inferences to explain his observations.

A. The seeds are dead.

B. It is too hot for the plants to grow.

He beings watering the soil every day and in a few days seedlings begin to appear. The temperature in the room has remained unchanged. Which of the above inferences should the child reject on the basis of these additional observations? Circle the letter in front of any statement he should reject.

He observes that the young seedlings have pale yellow leaves and that the stems are quite thin and spindley. He makes two inferences to explain his observations.

A. There is not enough nitrogen in the soil.

B. The plants are not receiving enough light.

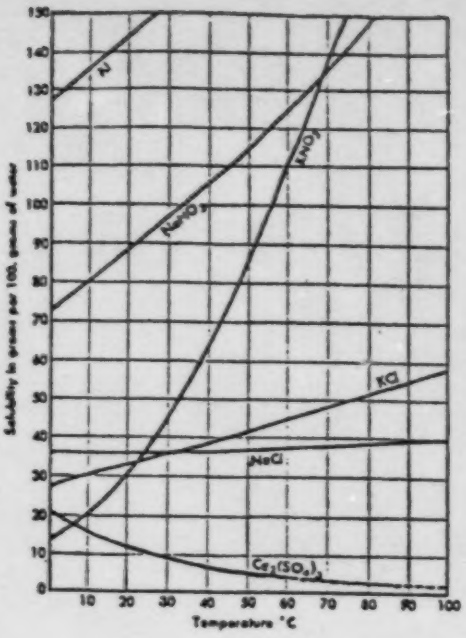
He places some seedings in two trays containing different soil mixtures and places the two trays in a window. After several days the seedlings in one tray still have tall, spindley stems with pale colored leaves while in the other tray the seedlings have thick stems and bright green leaves. Which of the above inferences should the child reject on the basis of these additional observations? Circle the letter in front of any statement he should reject?

Idea Credits: Graph of Chemical response from Modern Chemistry (Holt) Metcalfe, Williams, Castlce 1966 p. 189. Aquarium and seeds item idea from AAAS-Science Proces. Measure for Teachers-Form A, Zerox 1973. Worms item idea from NSF Report-"Evaluating Intellectual Development" using written responses to selected science problems-John Renner-Grant #EPP 75-19596-1977.

All other contributions made by Dr. Joe Evans, Glenville State College 1978.

NAME _____

This graph gives some data about the amount of six different chemicals that will dissolve in 100 grams of water at various temperatures. Examine the graph carefully and answer the following questions:



How many grams of KNO_3 will dissolve in 100 grams of water at 10°C? _____

How many grams of KNO_3 will dissolve in 100 grams of water at 50°C? _____

How many grams of $Ce_2(SO_4)_3$ will dissolve in 100 grams of water at 10°C? _____

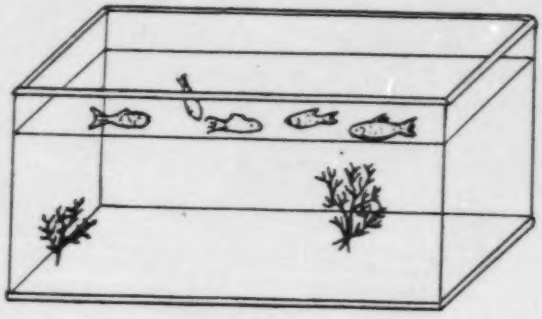
How many grams of $Ce_2(SO_4)_3$ will dissolve in 100 grams of water at 50°C? _____

At what temperature will the same amount of KCl and NaCl dissolve in 100 grams of water? _____

Place an X in the appropriate column below to indicate whether the data for each of the chemicals support or do not support the following statement: The higher the temperature of the water, the greater the quantity of chemical that will dissolve.

Support the Statement	Do Not Support the Statement	Chemical
____	____	KI
____	____	$Ce_2(SO_4)_3$
____	____	$NaNO_3$
____	____	KNO_3
____	____	KCl
____	____	NaCl

The aquarium in the picture has been located in a warm, dark area. The water is cloudy and foul smelling. The fish have come to the top of the water; one fish is dead. There are two live plants in the aquarium.



Place an "X" in the appropriate column below to indicate whether the following statements might be true, mark true; otherwise mark false.

	True	False
There is a well balanced environment in the aquarium.	____	____
There is a lack of oxygen in the water.	____	____
The aquarium is not receiving enough light.	____	____
Overfeeding has occurred.	____	____
To permanently correct the situation, the only thing the aquarium needs is a water change.	____	____
Moving the aquarium to the window will help the plants and increase the oxygen supply.	____	____
More fish will help the environment in the aquarium.	____	____
A filtering system would <u>help</u> solve the problem.	____	____
There is more oxygen at the top of the aquarium.	____	____
The dead fish suffocated.	____	____

N = 250

STUDENT RESULTS
PROBLEM SOLVING

PRE	POST	GAIN
1. 120	1. 126	1. +6
2. 53	2. 62	2. +9
3. 71	3. 75	3. +4
4. 83	4. 80	4. -3
5. 89	5. 69	5. -20
6. 143	6. 143	6. +0
7. 126	7. 128	7. +2
8. 144	8. 135	8. -9
9. 140	9. 131	9. -9
10. 140	10. 137	10. -3
11. 125	11. 125	11. +0
12. 157	12. 135	12. -22
13. 166	13. 156	13. -10
14. 151	14. 149	14. -2
15. 92	15. 89	15. -3
16. 104	16. 101	16. -3
17. 147	17. 164	17. +17
18. 132	18. 130	18. -2
19. 165	19. 166	19. +1
20. 161	20. 160	20. -1
21. 149	21. 148	21. -1
22. 132	22. 136	22. +4
23. 105	23. 96	23. -9
24. 102	24. 111	24. +9
25. 110	25. 102	25. -8
26. 111	26. 94	26. -17
27. 100	27. 93	27. -7
28. 104	28. 116	28. +12
29. 31	29. 8	29. -23
TOTAL 3,453	TOTAL 3,365	TOTAL -88.00

N = 11

TEACHER RESULTS
PROBLEM SOLVING

Tally of Correct Responses

PRE ITEM		P_1 POST ITEM		P_2 POST ITEM	
1.	11	1.	11	1.	10
2.	9	2.	10	2.	8
3.	9	3.	10	3.	8
4.	10	4.	10	4.	10
5.	8	5.	8	5.	10
6.	10	6.	10	6.	11
7.	10	7.	9	7.	11
8.	10	8.	10	8.	11
9.	10	9.	10	9.	11
10.	9	10.	9	10.	11
11.	6	11.	7	11.	9
12.	10	12.	11	12.	11
13.	11	13.	10	13.	11
14.	10	14.	9	14.	10
15.	4	15.	5	15.	10
16.	10	16.	11	16.	11
17.	10	17.	9	17.	11
18.	10	18.	9	18.	11
19.	11	19.	11	19.	11
20.	7	20.	9	20.	10
21.	10	21.	9	21.	10
22.	11	22.	8	22.	11
23.	10	23.	8	23.	10
24.	7	24.	5	24.	11
25.	9	25.	9	25.	10
26.	9	26.	10	26.	11
27.	4	27.	3	27.	9
28.	9	28.	9	28.	8
TOTAL	254	TOTAL	249	TOTAL	286

STATEMENT OF RESULT VALIDITY
OF
PROBLEM SOLVING TEST

The validity of the test results may be considered questionable due to the pilot intorduction at the end of the school year and the short amount of time available for teacher preparation and student involvement. The students often did better on the pretest than the posttest because of a lack of interest in school work at term's end. Many students were only interested in taking tests that contributed to a letter grade. The number of days left in the school year did not give enough time for the teacher to incorporate the information and ideas presented at the workshop into an acceptable plan of learning for the students.

The problem-solving instrument was newly constructed and had deficiencies for measuring accurately the changes that occurred in the student's problem-solving ability. The instrument did fairly represent the change in the teacher's ability.

OBJECTIVE NUMBER 6

The project staff shall develop and administer an analysis instrument designed to determine the effectiveness of the project model.

This objective has been completed by instruments The Way I Feel and Some Ideas I Have that are found on pages 91 through 119.

Name_____ Check One:

School_____

Boy ☐ Girl ☐

Grade_____ Date_____

OUR WORLD OF TODAY

OUR WORLD OF TOMORROW

Instructions:

We are interested in finding out what people your age think about "our world of today" and "our world of tomorrow." Knowing this can help teachers plan more interesting things to do in and outside school.

DON'T WORRY about right answers. Ther are NO right answers. Just write what you feel. Thank you for helping us.

Turn the page now to practice making your answers.

U.S. Office of Health,
Education & Welfare
National Institute of
Education

Project No. 1-E-026
Grant No. OEG-5-72-0045(509)

May 1974

Here you can practice to be sure you know the right way to tell us what you think. Let's look at the example below to see just how it should be done.

Suppose we want to know how you feel about SUMMER VACATION. The following pair of words can be used to tell how you feel about SUMMER VACATION.

fun ___:___:___:___:___ Boring

If you feel that SUMMER VACATION is very much like one end of the scale, you should place your X like this:

fun _X_:___:___:___:___ boring

(This would mean you think summer vacation is a lot of fun.) OR you could place your X like this:

fun ___:___:___:___:_X_ boring

(This would mean you think summer vacation is very boring.)

If you feel that SUMMER VACATION is more like one or the other end of the scale, but not all the way, you should place your X like this:

fun ___:_X_:___:___:___ boring

or

fun ___:___:___:_X_:___ boring

If you think that SUMMER VACATION is just so-so or is neither fun or boring, then put your X right in the middle:

fun ___:___:_X_:___:___ boring

NOW TRY A FEW YOURSELF:

fun ___:___:___:___:___ boring

sad ___:___:___:___:___ happy

bright ___:___:___:___:___ dull

If you have any questions, ask for help. If you understand how to mark this page, go on to the next page.

Now, forget about SUMMER VACATION. Tell us how you feel about OUR WORLD OF TODAY. The following words describe or tell about OUR WORLD OF TODAY. Put your X on each line just like you did for the practice page.

OUR WORLD OF TODAY

good	___:___:___:___:___	bad
dislike	___:___:___:___:___	like
neat	___:___:___:___:___	littered
crowded	___:___:___:___:___	roomy
valuable	___:___:___:___:___	worthless, cheap
gloomy	___:___:___:___:___	bright
sickening	___:___:___:___:___	healthful
pretty	___:___:___:___:___	ugly
imperfect	___:___:___:___:___	perfect
beautiful	___:___:___:___:___	ugly
sad	___:___:___:___:___	happy
pure	___:___:___:___:___	polluted
safe	___:___:___:___:___	dangerous
sweet-smelling	___:___:___:___:___	stinking
hazy	___:___:___:___:___	sunny
clean	___:___:___:___:___	dirty
unpleasant	___:___:___:___:___	pleasant
awful	___:___:___:___:___	nice

Now, forget about OUR WORLD OF TODAY. Tell us how you feel about OUR WORLD OF TOMORROW. The following words can describe or tell about OUR WORLD OF TOMORROW. Put your X on each line just like you did for the other page.

OUR WORLD OF TOMORROW

neat	___:___:___:___:___	littered
safe	___:___:___:___:___	dangerous
pretty	___:___:___:___:___	ugly
dislike	___:___:___:___:___	like
sad	___:___:___:___:___	happy
valuable	___:___:___:___:___	worthless, cheap
awful	___:___:___:___:___	nice
gloomy	___:___:___:___:___	bright
beautiful	___:___:___:___:___	ugly
sickening	___:___:___:___:___	healthful
sweet-smelling	___:___:___:___:___	stinking
imperfect	___:___:___:___:___	perfect
hazy	___:___:___:___:___	sunny
clean	___:___:___:___:___	dirty
pure	___:___:___:___:___	polluted
unpleasant	___:___:___:___:___	pleasant
good	___:___:___:___:___	bad
crowded	___:___:___:___:___	roomy

Now, look over the last two lists. Make sure you put <u>one X on each line</u>.

TEACHER SS #_____
SCHOOL NAME_____
GRADE_____
NUMBER OF STUDENTS 134

AFFECTIVE
OUR WORLD OF TODAY
OF TOMORROW

Itemization Tally
Of
Total Student Responses

	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	
+Good	127:	72	29:	74	87:	154	19:	23	28:	35	Bad
-Dislike	25:	30	19:	20	50:	60	62:	78	149:	129	Like
+Neat	69:	59	24:	34	57:	74	55:	52	113:	91	Littered
-Crowded	108:	96	46:	54	108:	87	26:	29	53:	48	Roomy
+Valuable	116:	110	67:	61	66:	80	16:	26	44:	26	Worthless, Cheap
-Gloomy	39:	37	22:	30	67:	84	60:	68	116:	87	Bright
-Sickening	53:	54	27:	45	96:	98	58:	55	85:	61	Healthful
+Pretty	115:	108	59:	71	67:	72	21:	20	29:	36	Ugly
-Imperfect	74:	57	32:	50	104:	95	45:	50	59:	52	Perfect
+Beautiful	118:	96	69:	80	79:	73	22:	26	29:	23	Ugly
-Sad	32:	38	14:	26	59:	76	75:	59	127:	101	Happy
+Pure	57:	47	22:	38	61:	75	50:	64	119:	90	Polluted
+Safe	63:	52	35:	43	93:	91	46:	50	74:	71	Dangerous
+Sweet-Smelling	77:	66	61:	67	98:	103	27:	29	45:	42	Stinking
-Hazy	36:	39	16:	23	71:	79	69:	70	114:	105	Sunny
+Clean	60:	58	53:	59	105:	93	46:	40	49:	61	Dirty
-Unpleasant	36:	44	19:	44	72:	73	92:	83	94:	75	Pleasant
-Awful	48:	44	16:	14	65:	81	68:	65	116:	141	Nice

Totals (to examine extremes)

	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	
+Neat	103:	93	35:	46	60:	61	30:	40	75:	61	Littered
+Safe	91:	79	52:	51	55:	66	37:	46	68:	62	Dangerous
+Pretty	115:	107	76:	62	50:	68	28:	23	39:	33	Ugly
-Dislike	49:	42	20:	28	60:	57	55:	64	130:	116	Like
-Sad	44:	45	19:	29	62:	65	66:	59	118:	109	Happy
+Valuable	120:	105	60:	66	60:	73	27:	19	42:	42	Worthless, Cheap
-Awful	41:	36	32:	20	57:	68	68:	71	120:	114	Nice
-Gloomy	44:	40	25:	40	61:	65	66:	71	102:	96	Bright
+Beautiful	121:	109	73:	76	59:	61	34:	21	23:	39	Ugly
-Sickening	55:	43	29:	99	70:	64	68:	67	88:	98	Healthful
+Sweet-Smelling	92:	92	53:	65	73:	79	43:	34	52:	41	Stinking
-Imperfect	58:	44	46:	42	88:	81	48:	62	81:	73	Perfect
-Hazy	34:	43	32:	31	61:	66	66:	66	103:	110	Sunny
+Clean	97:	87	68:	55	55:	68	49:	56	42:	46	Dirty
+Pure	69:	70	45:	46	60:	64	48:	51	85:	74	Polluted
-Unpleasant	49:	44	27:	32	63:	68	76:	75	101:	87	Pleasant
+Good	120:	118	68:	101	59:	53	26:	29	31:	37	Bad
-Crowded	103:	82	45:	60	65:	73	28:	28	67:	74	Roomy

EVALUATION OF RESULTS
FOR
AFFECTIVE - OUR WORLD OF TODAY
OF TOMORROW
STUDENT

Nine key comparisons were analyzed as follows:

COMPARING WORDS	PRETEST [1] 1/r [2]	POSTTEST [3] 1/r [4]	PRETEST [5] EXTREME/ MIDDLE [6]	POSTTEST [7] EXTREME/ MIDDLE [8]	FLOW ← EXTREME → MIDDLE ⟷ NO CHANGE
NEAT/LITTERED					
Today	93/168	93/143	182/136	150/160	→
Future	138/105	139/101	178/125	134/147	→
CROWDED/ROOMY					
Today	154/79	150/77	161/180	144/170	⟷
Future	148/95	142/102	170/138	156/161	→
SICKENING/HEALTHFUL					
Today	80/143	109/116	138/181	115/198	→
Future	84/156	142/165	143/167	141/230	→
BEAUTIFUL/UGLY					
Today	197/51	176/49	147/170	119/179	→
Future	194/57	185/60	144/166	148/158	⟷
PURE/POLLUTED					
Today	79/169	85/154	176/133	137/177	→
Future	114/133	116/125	174/153	144/171	→
SAFE/DANGEROUS					
Today	98/120	95/121	137/174	123/184	→
Future	143/105	130/108	159/144	141/163	→
SWEET SMELLING/STINKING					
Today	138/72	133/71	122/186	108/199	→
Future	145/95	157/75	144/169	133/178	→
HAZY/SUNNY					
Today	52/183	62/175	150/156	144/172	→
Future	66/169	74/176	137/159	153/163	←
CLEAN/DIRTY					
Today	103/95	107/101	109/201	119/192	←
Future	165/91	142/102	139/172	133/179	→

[1] Derived by adding the first two columns on the pretest tally sheet.
[2] Derived by adding the last two columns on the pretest tally sheet.
[3] Derived by adding the first two columns on the posttest tally sheet.
[4] Derived by adding the last two columns on the posttest tally sheet.
[5] Derived by adding the first and last columns on the pretest tally sheet.
[6] Derived by adding the second, third and fourth columns on the pretest sheet.
[7] Derived by adding the first and last columns on the posttest tally sheet.
[8] Derived by adding the second, third and fourth on the posttest tally sheet.

AFFECTIVE, OUR WORLD OF TODAY OF TOMORROW
(Summary Sheet to go with Data)
Student

1. Neat to Litter
   Now littered but will get better.

2. Crowded to Roomy
   Crowded today may slow up tomorrow.

3. Sickening to Healthful
   Healthful now and will continue.

4. Beautiful to Ugly
   Beautiful and will stay so.

5. Pure to Polluted
   Now polluted but will get better.

6. Safe to Dangerous
   Now dangerous, will become safer.

7. Sweet Smelling to Stinking
   Sweet smelling now, will get better.

8. Hazy to Sunny
   Sunny now, will get better.

9. Clean to Dirty
   Clean now, will get cleaner.

The students gave a very optimistic view of the future world.

AFFECTIVE
OUR WORLD OF TODAY
OF TOMORROW

Itemization Tally
Of
Total Teacher Responses

	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	
Good	5	4	10	8	4	4	0	8	0	0	Bad
Dislike	0	0	0	0	2	2	9	9	7	6	Like
Neat	0	0	1	3	6	7	8	6	4	2	Littered
Crowded	5	2	4	11	7	4	3	0	0	0	Roomy
Valuable	13	6	4	8	2	2	0	1	0	0	Worthless, Che
Gloomy	0	0	4	1	3	1	12	10	3	4	Bright
Sickening	0	0	4	1	1	6	13	9	0	1	Healthful
Pretty	5	4	10	8	2	4	2	1	0	0	Ugly
Imperfect	1	0	5	5	8	8	4	3	0	1	Perfect
Beautiful	4	2	12	12	2	2	1	1	0	0	Ugly
Sad	0	0	0	1	3	3	14	11	2	2	Happy
Pure	1	0	1	2	5	4	10	9	2	2	Polluted
Safe	0	0	6	6	7	7	6	4	0	0	Dangerous
Sweet-Smelling	0	0	9	6	8	5	2	6	0	0	Stinking
Hazy	0	0	2	1	6	5	9	10	2	2	Sunny
Clean	0	0	8	3	4	10	6	4	0	0	Dirty
Unpleasant	0	0	1	1	2	4	12	11	4	1	Pleasant
Awful	0	0	1	1	4	2	9	10	5	4	Nice

	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	
Neat	0	2	6	8	6	0	0	4	7	3	Littered
Safe	0	1	6	10	10	0	1	3	3	3	Dangerous
Pretty	3	1	6	9	7	3	1	4	2	0	Ugly
Dislike	2	0	0	3	2	1	12	10	3	3	Like
Sad	2	0	1	3	3	4	10	9	2	1	Happy
Valuable	5	3	8	10	2	1	2	3	2	0	Worthless, Cheap
Awful	2	0	1	3	3	2	8	11	6	2	Nice
Gloomy	2	0	1	3	4	2	8	10	4	2	Bright
Beautiful	3	2	8	8	4	4	2	3	2	0	Ugly
Sickening	3	0	0	3	6	3	9	9	1	2	Healthful
Sweet-Smelling	1	0	6	6	9	7	1	3	2	1	Stinking
Imperfect	3	0	3	6	7	1	6	10	0	0	Perfect
Hazy	2	0	6	6	5	3	6	7	1	1	Sunny
Clean	2	1	8	9	3	3	4	4	2	0	Dirty
Pure	1	1	5	6	4	1	5	7	4	1	Polluted
Unpleasant	2	2	1	3	6	2	8	9	1	1	Pleasant
Good	2	1	10	10	2	4	1	1	3	1	Bad
Crowded	4	6	11	5	2	2	2	4	0	0	Roomy

EVALUATION OF RESULTS
FOR
AFFECTIVE - OUR WORLD OF TODAY
OF TOMORROW
TEACHER

Nine key comparisons were analyzed as follows:

COMPARING WORDS	PRETEST [1]1/r[2]	POSTTEST [3]1/r[4]	PRETEST [5]EXTREME/MIDDLE[6]	POSTTEST [5]EXTREME/MIDDLE[6]	FLOW ←E →M ⟷ No Chang
NEAT/LITTERED					
Today	1/12	3/8	4/15	2/16	→
Future	6/7	10/7	7/12	5/12	→
CROWDED/ROOMY					
Today	9/3	13/0	5/14	2/15	→
Future	15/2	11/4	4/15	6/11	←
SICKENING/HEALTHFUL					
Today	4/13	1/10	0/18	1/16	←
Future	3/10	3/11	4/15	2/15	→
BEAUTIFUL/UGLY					
Today	16/1	14/1	4/15	2/15	→
Future	11/4	10/3	5/14	2/15	→
[illegible]RE/POLLUTED					
Today	2/12	2/11	3/16	2/15	→
Future	6/9	7/8	5/14	2/14	→
SAFE/DANGEROUS					
Today	6/6	6/4	0/19	0/17	⟷
Future	6/4	11/6	3/17	4/14	←
SWEET SMELLING/STINKING					
Today	9/2	6/6	0/19	0/17	⟷
Future	7/3	6/4	3/16	1/16	→
HAZY/SUNNY					
Today	2/11	1/12	2/17	2/16	→
Future	8/7	6/8	3/17	1/16	→
CLEAN/DIRTY					
Today	8/6	3/4	0/18	0/17	⟷
Future	10/6	10/4	4/16	1/16	→

[1]Derived by adding the first two columns on the pretest tally sheet.
[2]Derived by adding the last two columns on the pretest tally sheet.
[3]Derived by adding the first two columns on the posttest tally sheet.
[4]Derived by adding the last two columns on the posttest tally sheet.
[5]Derived by adding the first and last columns on the pretest tally sheet.
[6]Derived by adding the second, third and fourth columns on the pretest tally sheet.
[7]Derived by adding the first and last columns on the posttest tally sheet.
[8]Derived by adding the second, third and fourth columns on the posttest tally sheet.

AFFECTIVE, OUR WORLD OF TODAY OF TOMORROW

TEACHER SUMMARY SHEET

1. Neat to Litter
   Now littered but will get better.

2. Crowded to Roomy
   Will become more crowded (pretest). Crowded today, but will become less (posttest).

3. Sickening to Healthful
   Healthful now and will continue.

4. Beautiful to Ugly
   Beautiful and will become ugly.

5. Pure to Polluted
   Now polluted but will get better.

6. Safe to Dangerous
   Moderately safe but will become safer.

7. Sweet Smelling to Stinking
   Sweet smelling now, will get stinkier (pretest). Moderately stinky will improve (posttest).

8. Hazy to Sunny
   Sunny now, will become hazy.

9. Clean to Dirty
   Moderately clean now, will get cleaner.

The teachers provided a moderate optimistic view of the future world.

Teachers attitudes changed from the pre and posttest on items crowded to roomy and sweet smelling to stinking. Results identified our future world as becoming less populated and better smelling. Reasons for this change of attitude may be attributed to the information presented in the workshop about our environment, especially air quality and population growth for the past few years.

Of items analyzed, no major attitude transfer were present. Increased instructional time was discussed as a factor that is needed to cause attitude changes in young learners.

Name_____

School_____ Check one: Boy ☐ Girl ☐

Grade_____Date_____

SOME IDEAS I HAVE

U.S. Office of Health,
Education & Welfare
National Institute of
Education

Project No. 1-E-026
Grant No. OEG-5-72-0045(509)

May 1974

INSTRUCTIONS: We are interested in finding out what students think about some things. Knowing this can help teachers plan interesting things to do in and outside school. We will add up how your class feels, and then later on, you can see if your classmates feel like you do.

DON'T WORRY about right answers. There are no right answers. Just write what you feel. Thank you for helping us.

Turn the page now to practice making your answers.

STUDENT
INFORMATION SHEET

NAME_____

AGE_____SCHOOL_____ Circle one: BOY GIRL

GRADE_____DATE_____

To help us understand you and your ideas better, please tell us:

1. What job does your father have?_____

2. What job does your mother have?_____

3. Do you live near enough to walk to this school? (Circle one) YES NO

4. If you ride a bus to school, how long does it take?_____minutes.

5. Have you always lived in the same city or place you live now?

   Circle one: YES NO (If no, please answer the questions below)

   a. How long have you lived where you live now?_____

   b. Where was the last place you lived?_____

   c. How long did you live there?_____

   d. Where was this place? CHECK ONE:

   _____It was in a big city.

   _____It was near a big city.

   _____It was in a small town.

   _____It was near a small town.

   _____It was on a farm.

Practice marking the following ideas:

	STRONGLY AGREE	AGREE	NOT SURE DON'T KNOW	DISAGREE	STRONGLY DISAGREE
1. Today is a sad day.					
2. We should have less homework every night.					
3. Roller skating is more fun than swimming.					
4. I like to read books.					
5. Watching TV is boring.					

If you understand how to mark these ideas, START MARKING the ideas below. If you need help, raise your hand.

	STRONGLY AGREE	AGREE	NOT SURE DON'T KNOW	DISAGREE	STRONGLY DISAGREE
1. From now on, people getting married should have no more than two children					
2. We have enough parks and forests now for wild animals to live in.					
3. Motorbikes and motorcycles should be made quieter.					
4. It is O.K. for the number of people living in our country to get bigger.					
5. On a picnic take paper plates and cups instead of plates and cups you can use over.					
6. I litter a lot.					
7. Walking in the woods is spoiled if too many people are there.					
8. Soon there may be too many people living on the earth					
9. If my dad owned a marsh where ducks lived, I would like a playgroung built there.					
10. There is too much on TV about pollution and the environment.					
11. Too much noise is not really a problem to worry about.					
12. I would be willing to keep people out of a park near my home if wild animals needed a safe home there.					
13. We need more laws to help stop pollution.					

	STRONGLY AGREE	AGREE	DON'T KNOW NOT SURE	DISAGREE	STRONGLY DISAGREE
14. The best way to get rid of old newspapers is to burn them.					
15. There is not much one person can do to help the environment.					
16. I think I can help solve some pollution problems.					
17. It is important to learn about environmental problems in school.					
18. My neighborhood should be kept clean, even if I would have to pick up litter after school one day a week.					
19. If my car made too much air pollution, I would get it fixed.					
20. My family cannot do any more to help stop pollution.					
21. Don't waste the best TV time with programs about pollution.					
22. I think paper should be recycled (used over) even if I have to collect it.					
23. Children worry too much about problems of the environment.					
24. Paper towels are better than cloth towels in a school washroom.					
25. Parents should have as many children as they want.					
26. I like to hear a lot about environmental problems.					
27. If a city needs more homes for people, then build taller buildings. Don't use up land outside the city.					
28. Milk at school should come in bottles that can be used over, not paper cartons.					
29. Over population (too many people) is the cause of many problems today.					
30. I feel responsible for causing some pollution.					
31. Use a lot of weed killer in your garden, so you won't have so many weeds to pull.					
32. Sometimes people protesting about pollution can help as much as a law against pollution.					
33. We should do more to protect forests and wild animals.					

	STRONGLY AGREE	AGREE	NOT SURE DON'T KNOW	DISAGREE	STRONGLY DISAGREE
34. I do not worry very much about the environment.					
35. Soda pop should be sold only in bottles that can be used again, not in cans.					
36. I cannot find and help solve environmental problems around where I live.					
37. Pollution is the number one problem in our country.					

38. Here is a list of environmental problems. First, CIRCLE the ONE problem that you think is most important (only one problem, please). Then, CROSS OUT the ONE problem you think is not so important (only one problem, please). When you are done, there should be one problem with a circle around it, and one problem crossed out.

AIR POLLUTION

WATER POLLUTION

TOO MANY PEOPLE

CHEMICAL POLLUTION

NOISE POLLUTION

LEAVING SOME LAND ALONE

39. People have different ideas on who can help protect the environment, and stop pollution. Here is a list of pople who migh help. First, CIRCLE the one on the list that can help most. Circle only one. Then, CROSS OUT the one on the list that can help least (not help much). Cross out only one.

THE MAYOR

ME AND MY FRIENDS

THE PRESIDENT

PEOPLE WHO LIVE AROUND HERE

MY FAMILY

SCIENTISTS

+++ + + +

N = 19

AFFECTIVE
SOME IDEAS I HAVE
TEACHERS

	STRONGLY AGREE		AGREE		NOT SURE DON'T KNOW		DISAGREE		STRONGLY DISAGREE	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1.	4	6	8	7	2	3	5	2	0	0
2.	0	1	1	2	3	0	10	10	5	5
3.	6	10	9	7	2	0	2	1	0	0
4.	0	0	1	2	3	3	9	7	6	5
5.	2	1	8	6	3	2	4	7	2	2
6.	0	0	1	2	0	1	9	9	8	6
7.	4	3	12	14	0	0	3	1	0	0
8.	4	7	9	9	5	2	1	0	0	0
9.	0	0	3	2	0	1	8	9	8	6
10.	0	0	0	0	3	1	9	13	7	4
11.	0	0	1	0	0	1	11	8	7	9
12.	5	3	9	9	3	2	1	3	1	1
13.	7	7	8	8	1	1	2	2	1	0
14.	0	0	3	2	0	1	12	10	4	5
15.	0	0	1	0	1	0	11	13	6	5
16.	3	1	12	14	3	2	1	0	0	1
17.	8	8	11	10	0	0	0	0	0	0
18.	3	2	12	15	2	0	2	1	0	0
19.	2	7	11	9	6	1	0	0	0	1
20.	1	0	1	1	2	1	13	13	2	3
21.	0	0	2	3	1	0	16	13	0	3
22.	2	4	13	13	4	0	1	0	0	1
23.	0	0	1	0	1	1	11	11	7	5
24.	4	2	8	5	1	1	5	8	1	2
25.	0	0	3	2	5	1	6	9	6	6
26.	0	1	6	9	7	3	5	5	1	0
27.	0	3	5	8	11	2	4	5	0	0
28.	0	2	6	5	4	2	7	7	3	2
29.	3	9	10	9	6	0	1	0	0	0
30.	0	1	16	16	1	0	2	1	1	0

AFFECTIVE
SOME IDEAS I HAVE

	STRONGLY AGREE		AGREE		NOT SURE DON'T KNOW		DISAGREE		STRONGLY DISAGREE	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
31.	1	0	1	0	2	1	13	10	3	7
32.	3	5	12	13	5	0	0	0	1	0
33.	10	9	10	7	0	2	0	0	0	0
34.	2	1	4	2	2	2	11	8	1	5
35.	3	6	8	6	1	0	7	5	0	1
36.	1	0	1	0	4	2	13	11	0	5
37.	1	4	4	4	6	4	7	6	1	0

38.

TALLY CIRCLES			TALLY CROSS OUTS	
Pre	Post		Pre	Post
7	8	AIR POLLUTION	0	0
4	3	WATER POLLUTION	0	0
3	8	TOO MANY PEOPLE	3	2
4	0	CHEMICAL POLLUTION	1	2
0	0	NOISE POLLUTION	8	8
1	0	LEAVING SOME LAND ALONE	5	6

39.

TALLY CIRCLES			TALLY CROSS OUTS	
Pre	Post		Pre	Post
0	1	THE MAYOR	10	4
3	6	ME AND MY FRIENDS	1	0
4	1	THE PRESIDENT	1	0
10	6	PEOPLE WHO LIVE AROUND HERE	5	8
0	3	MY FAMILY	1	0
2	1	SCIENTISTS	1	4

N = 332

AFFECTIVE
SOME IDEAS I HAVE
STUDENTS

	STRONGLY AGREE		AGREE		NOT SURE DON'T KNOW		DISAGREE		STRONGLY DISAGREE	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1.	36	42	37	31	81	79	69	60	76	77
2.	39	40	45	42	73	74	61	72	75	73
3.	64	70	92	78	42	51	47	41	41	39
4.	52	41	70	55	85	98	55	60	35	33
5.	81	68	87	85	60	53	40	42	20	21
6.	17	21	45	59	48	51	96	103	84	67
7.	81	71	80	81	57	62	58	49	32	26
8.	67	61	62	59	86	83	45	43	38	27
9.	51	27	51	63	71	81	68	59	65	61
10.	36	36	51	49	60	90	69	73	72	52
11.	46	37	54	56	42	66	79	64	69	63
12.	118	108	92	86	40	54	20	24	20	16
13.	133	137	87	68	32	39	14	14	17	17
14.	55	56	68	64	52	56	63	52	54	58
15.	43	39	74	74	65	72	64	62	41	25
16.	39	39	82	85	89	79	42	39	24	25
17.	90	82	110	106	47	53	17	23	18	14
18.	90	92	99	103	44	52	27	23	25	21
19.	99	97	117	110	34	46	13	23	19	21
20.	33	31	76	54	63	89	87	73	51	41
21.	51	40	64	53	67	95	63	53	33	46
22.	62	69	91	83	67	65	33	35	28	29
23.	27	34	51	40	86	88	73	67	51	52
24.	87	77	81	88	46	59	49	28	26	30
25.	102	79	90	62	48	67	21	36	20	31
26.	36	40	49	53	80	73	57	56	52	49
27.	63	54	69	64	93	102	38	28	18	25
28.	52	49	56	70	63	58	56	50	54	50
29.	63	49	80	87	82	81	31	39	23	26
30.	45	49	98	110	66	66	42	44	28	25

AFFECTIVE
SOME IDEAS I HAVE

	STRONGLY AGREE		AGREE		NOT SURE DON'T KNOW		DISAGREE		STRONGLY DISAGREE	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
31.	57	43	60	63	50	70	63	45	51	61
32.	57	60	98	80	76	89	40	33	22	17
33.	161	141	68	57	22	42	19	17	14	26
34.	39	36	67	60	47	50	72	54	34	41
35.	51	56	82	86	53	73	48	28	24	26
36.	37	28	57	46	58	68	63	67	42	40
37.	74	56	92	86	49	53	28	31	18	17

38.

TALLY CIRCLES			TALLY CROSS OUTS	
Pre	Post		Pre	Post
138	128	AIR POLLUTION	15	20
53	47	WATER POLLUTION	13	5
20	25	TOO MANY PEOPLE	84	71
33	36	CHEMICAL POLLUTION	26	10
8	10	NOISE POLLUTION	47	50
10	10	LEAVING SOME LAND ALONE	87	77

39.

TALLY CIRCLES			TALLY CROSS OUTS	
Pre	Post		Pre	Post
15	28	THE MAYOR	45	47
29	39	ME AND MY FRIENDS	50	49
93	76	THE PRESIDENT	50	52
75	62	PEOPLE WHO LIVE AROUND HERE	37	24
15	10	MY FAMILY	25	25
28	33	SCIENTISTS	77	50

POPULATION

Students

	(Strongly Agree + Agree)		(Strongly Disagree + Disagree)	
	Pre	Post	Pre	Post
1.	73	73	45	137
4.	122	96	90	93
7.	161	152	80	3
8.	129	120	83	70
25.	192	141	41	67
29.	143	136	54	65

Teachers

	(Strongly Agree + Agree)		(Strongly Disagree + Disagree)	
	Pre	Post	Pre	Post
1.	12	13	5	2
4.	1	2	14	12
7.	16	17	3	1
8.	13	16	1	0
25.	3	2	12	15
29.	13	18	1	0

Questions:

1. Same teacher agree; students disagree; majority against control.

4. Teachers - no change; students not sure toward majority against control.

7. Teachers - no change; students change toward not sure but majority still agree should be control.

8. Students and teachers agree for control; not much change.

25. Teachers are stronger for control. Students change toward control with majority still against family control.

29. Majority of students and teachers agree with increase, more students disagree in post test.

POPULATION

There was no significant change in teachers' attitudes from pretest to posttest from population control. There was a slight shift toward population control on the posttest for the students. The main point of difference in student-teacher responses dealt with limiting the family size. Students did not want family size limited even though they agreed there is a problem with overpopulation.

"POLLUTION"

Students

	(Strongly Agree + Agree)		(Strongly Disagree + Disagree)	
	Pre	Post	Pre	Post
3.	156	148	88	80
11.	100	93	148	127
14.	123	120	117	110
19.	216	207	32	44
22.	153	152	61	64
24.	168	165	75	58
28.	108	119	110	100
31.	117	106	114	106
35.	143	142	72	54
37.	167	142	46	48

Teachers

	(Strongly Agree + Agree)		(Strongly Disagree + Disagree)	
	Pre	Post	Pre	Post
3.	15	17	2	1
11.	1	0	18	17
14.	3	2	16	15
19.	13	16	0	1
22.	15	17	1	1
24.	12	7	6	10
28.	6	7	10	9
31.	2	0	16	17
35.	11	12	7	6
37.	5	8	8	6

"POLLUTION"

Pre/Post(s)

Questions:

3. Less of a problem on the post, but it should be given more work. Teachers felt this was more of a problem and should be given more attention.

11. Most of the students feel that noise is a problem, felt less so on the posttest. Teachers same.

14. Slight agreement among students, while teachers were strongly opposed.

19. Most of the students agree, same with the teachers.

22. Little change from pre to post, but students do agree with the statement. Teachers same.

24. Students agree with little change from pre to post. Teachers are evenly divided. Slight change to the use of paper towels on the posttest.

28. Students evenly divided on the issue. Slight shift to the use of glass bottles on the posttest. Teachers also evenly divided.

31. Students evenly divided - no significant change from pre to post. Most teachers strongly disagree with the statement.

35. Most students agree with this. Change to glass bottles from pre to post. Teachers agree that glass bottles should be used. No significant change from pre to post.

37. Students agree that pollution is the number one problem. No significant change from pre to post. Teachers did not agree with the students on the pre but moved that way on the post.

"POLLUTION"

Based on data collected and analyzed from the test instrument, Some Ideas I Have, taken from items 3, 11, 14, 19, 22, 24, 28, 31, 35 and 37 dealing with pollution, the following conclusions have been drawn:

The students possess a positive attitude toward the problems of pollution, although there was an overall shift of approximately 11 percent toward the middle from the pre to the posttest. The shift could possibly be due to the short time that the students were involved in the program, (two weeks). The time factor could possibly have resulted in some confusion of the part of the student.

The teachers also have a positive attitude toward the problems of pollution, and this attitude increased from the pre to the posttest. Whereas the students were involved for a short time, the teachers were involved for a longer and more intense program, (two months) possibly resulting in a more significant positive attitude change.

LAND USE-WILDLIFE

Students

	(Strongly Agree + Agree)		(Strongly Disagree + Disagree)	
	Pre	Post	Pre	Post
2.	136	145	84	82
9.	133	120	102	90
12.	210	194	40	40
27.	132	118	56	53
37.	229	198	33	43

Teachers

	(Strongly Agree + Agree)		(Strongly Disagree + Disagree)	
	Pre	Post	Pre	Post
2.	15	15	1	3
9.	16	15	3	1
12.	14	12	2	4
27.	5	11	4	5
33.	20	16	0	0

The change in students' views is probably due to the short time in which they were associated with the project (two weeks). In this time interval, the large amount of information and activities may have contributed to some confusion to cause some to change from a positive view to a more neutral (or safe) view.

It was decided that the responses to questions 2, 9, 12, 27 and 33 came under this heading. The responses were divided into pre and post test results of both students and teachers. The results were further placed in order from positive to negative, dealing with environmentally sound concepts. Results show that the teachers did not change their views, which were positive, from pre to posttesting. The students results changed from a positive view to a more neutral stand by approximately 10 percent.

ENVIRONMENTAL RESPONSIBILITY
TEST SCORES

Students

	(Strongly Agree + Agree)		(Strongly Disagree + Disagree)	
	Pre	Post	Pre	Post
5.	168	153	60	63
6.	62	80	180	170
15.	117	113	105	87
16.	121	124	66	64
18.	189	195	52	44
20.	109	85	138	114
23.	78	74	119	124
30.	143	159	70	69
32.	155	140	62	50
34.	106	96	106	95
36.	94	74	105	107

Teachers

	(Strongly Agree + Agree)		(Strongly Disagree + Disagree)	
	Pre	Post	Pre	Post
5.	10	7	6	9
6.	1	2	17	15
15.	1	0	17	18
16.	15	15	1	1
18.	15	17	1	2
20.	2	1	15	16
23.	1	0	18	16
30.	16	17	3	1
32.	15	18	1	0
34.	6	3	12	13
36.	2	0	13	16

ENVIRONMENTAL RESPONSIBILITY
TEST ITEM ANALYSIS

The following comments were derived by comparing pre and post results for students and teachers.

5. The students and teachers were opposed to taking actions to correct environmental problems if the actions were considered an inconvenience. The students showed a slight shift toward conservation practices whereas the teachers showed a significant shift in the same direction.

6. The students and teachers disagree that they were responsible for littering but exhibited greater awareness on the posttest.

15. The students were not sure that one person could help in improving the environment whereas the teachers felt that one person could play a significant role. No change was exhibited.

16. However, the students felt they could help solve pollution problem; the teachers were even more positive.

18. The students and teachers demonstrated an increased willingness to work toward a clean environment.

20. On the posttest measure, the students and teachers indicated even a greater responsibility for helping to stop pollution.

23. Teachers and students agreed that children do not worry too much about pollution. No change.

30. The students and teachers strongly agreed they were responsible for causing some pollution. On the posttest, they exhibited an even greater awareness of their responsibilities.

32. The student felt that protesting environmental issues could cause change; the teachers were even stronger. No change.

34. On the pre and post measure, the students were neutral toward the environment. The teachers demonstrated an even greater concern following the workshop. experience.

36. The students became more confident in solving local environmental issues. The teachers concurred displaying an even stronger position.

FINAL SUMMARY
FOR
ENVIRONMENTAL RESPONSIBILITY

In final summary on the questions relating to "Environmental Responsibility" it was noted that students and teachers were aware on the pretest of the need for controlling environmental problems. Teachers were very strong in feeling that positive changes for improvement could be enacted by voicing needs. The pre and posttest comparison demonstrated that both groups exhibited personal responsibility for controlling the changing environmental issues and problems.

LAW, MEDIA, AND EDUCATION

Students

	(Strongly Agree + Agree)		(Strongly Disagree + Disagree)	
	Pre	Post	Pre	Post
10.	141	125	87	85
13.	220	205	31	31
17.	200	188	35	37
21.	96	99	115	93
26.	85	93	119	105

Teachers

10.	16	17	0	0
13.	15	15	3	2
17.	19	18	0	0
21.	16	19	2	3
26.	6	10	6	5

LAW, MEDIA, AND EDUCATION

In attitude on laws, media use and education about pollution and environment the following information was found:

1. No teacher thought there was too much on television about the environment and pollution and over 85 percent of them thought there should be more. There was no significant change from the pretest to the posttest.

   On both tests the teachers felt that prime time television should be used for programs on pollution.

   On the pretest, 50 percent of the students did not think there was too much on TV about pollution and the environment while 30 percent thought there was too much and 20 percent were undecided. On the posttest, an attitude change was shown in that about eight percent of the students showed indecision instead of that there was not too much about pollution and environment on television. On the pretest, the majority of the students did not want prime time TV used for programs about pollution while on the post they showed a tendency toward indecision.

2. Both teachers and students agree on both the pretests and posttests that it is important to learn about environmental problems in school. On the pretests, the majority of the students did not like to hear about environmental problems. However, the posttests show a significant change toward the positive with both teachers and students showing a marked interest in hearing about environmental problems.

3. Both teachers and students agreed on both tests that more laws are needed to help stop pollution.

Summary

Based on test data, which was intended to cultivate opinions concerning laws, media and education about environmental problems, it was found that the majority of the students and teachers have a positive attitude toward the need for more and better laws, the need for prime time media use and the need for more education about pollution and environment.

OBJECTIVE NUMBER 7

The project staff shall file a report describing:

(a) the initial and current status of environmental education in West Virginia,

(b) desirable modifications in the model or instruments used by the model,

(c) the effectiveness of the model in initiating environmental education where it was needed.

Part (a) is a representative evaluation of student and teacher thought about environmental education. See objective 6 found on pages 109 through 119.

Part (b) represents a desirable modification of the original workshop model and is found on pages 122 through 127.

Part (c) is a final statement of the evaluating team found on page 128.

IT (INDIVIDUAL TECHNOLOGY)
REVISED
ENVIRONMENTAL EDUCATION WORKSHOP MODEL
FOR TEACHERS

Day	Length (hrs.)	Activities
1	1	Pre-Assessment of Teachers
1	1	Orientation: ...explanation of workshop ...CTBS Data ...registration
1	1-2	Group Interaction Activity
1	2-4	Exemplary Activities (obtain top level projects for presentation)
1	2	Listening Activity - Groups of four and film "Cipher in the Snow"
2	8	Soil, Water, Forest Activities
2	2	Preview of Media
3	4	Field Trip - A Look at Cabwaylingo State Forest
3	2	Questioning Strategies
3	4	Planning Classroom Activities

At least a two-week break (recommended)

ALTERNATE PLAN A - ENVIRONMENTAL AWARENESS

4-5 two day trip to be developed:

Northern Route - Big Run Bog (Parsons)
Blackwater Falls
Canaan Valley
Dolly Sods
Seneca Rocks
Seneca Caverns or Smoke Hole Caverns
Spruce Knob
Sinks of Gandy
Bowden Fish Hatchery (Elkins)

IT (Individual Technology)

Southern Route - Greenbank Observatory
Cass Railroad
Droop Mountain Battlefield
Organ Cave - Lost World Cave
Pearl Buck's Home
Cranberry Glades
Hills Creek Falls
Beckley Exhibition Coal Mine
New River Bridge and Gorge
Hawk's Nest
Grandview Park
Edray Fish Hatchery
Gaudineer Scenic Area
Beartown State Park
Summit Lake
Bluestone Dam and State Park
Kates Mountain

ALTERNATE PLAN B - TEACHER TRAINING TECHNIQUES

Day	Length (hrs.)	Activities
4	2	Participant Reports on Field Activity with Students
4	2	Win - Win Conflict Resolution - Never Lose an Argument
4	4	Problem Solving Process - Activity
4	2	Resource Utilization - Panel Presentation
5	4	Simulation - Council Planning
5	4	Energy Simulator - Computer Application
5	2	Lesson Development - Teachers Plan a Unit for Students/Post Testing

ENVIRONMENTAL EDUCATION WORKSHOP FOR TEACHERS

AGENDA

WITH OBJECTIVES AND LEARNER OUTCOMES

DAY 1

Session 1 - 2 hours

Pre-Assessment of Teachers

Orientation
...explanation of workshop
...CTBS Data
...registration

Objectives: Acquaint teachers with overall purpose of the workshop.

Session II - 2-4 hours

Group Interaction Activity

Listening Activity - groups of four and film "Cipher in the Snow"

Objectives: To develop group dynamics, and personal relationships.

*Learner Outcome 15

Session III - 2-4 hours

Exemplary Activities (obtain top level people for presentations)

Objectives: To familiarize participants with on-going environmental programs within the state.

*Learner Outcome 6

DAY 2

Session 1 - 8 hours

Soil (People & Natural Resources, pp 3-18), Water (pp 46-66), Forest Activities (pp 86-97)

Objectives: To present the participants with types of inquiry oriented field activities as related to each topic.

*Learner Outcomes 1, 6, 8, 9, 11, 17

Session II - 2 hours

Preview of Media

Objectives: To make participants aware of the types of media available that deal with environmental education.

*Learner Outcomes 3, 4

AGENDA

DAY 3

Session I - 4 hours — Field Trip - A Look at Cabwaylingo State Forest

Objectives: To make participants aware of the different types of local plant life including tips on identification and utilization.

*Learner Outcomes 1, 6

Session II - 2 hours — Questioning Strategies (Sequence and Order)

Objectives: To familiarize participants with different questioning techniques and the responses they elicit.

*Learner Outcome 2

Session III - 4 hours — Planning Classroom Activities

Objectives: To prepare participants to implement one of the field activities in their own class when back at school.

*Learner Outcome 5

TWO WEEK BREAK (recommended)

ALTERNATE PLAN A - ENVIRONMENTAL AWARENESS

DAYS 4 and 5 — Two Day Trip

Objectives: To familiarize participant's with the outstanding environmental areas of the state.

To increase the participants appreciation of the beauty of the state.

To provide background information to aid participants in conducting their own field trip.

*Learner Outcomes 1, 6, 9, 11

AGENDA

ALTERNATE PLAN B - TEACHER TRAINING TECHNIQUES

DAY 4

Session 1 - 2 hours

Participant Reports on Field Activity with Students

Objectives: To develop an interchange of ideas, and evaluate activities based on problems encountered.

*Learner Outcome 19

Session 11 - 2 hours

Win - Win Conflict Resolution - Never Lose an Argument

Objectives: To develop respect for others ideas and for yourself.

*Learner Outcomes 15, 20

Session 111 - 4 hours

Problem Solving Process Activity

Objectives: To help participants develop proficiency in using process skills.

To assist participants in developing techniques for presenting process activities

*Learner Outcomes 1, 6, 7, 8, 9, 10, 11, 12

Session IV - 2 hours

Resource Utilization - Pannel Presentation

Objectives: To make participants aware of current resource utilization techniques in various fields.

*Learner Outcomes 15, 18

DAY 5

Session 1 - 4 hours

Simulation - Council Planning (People & Natural Resources, pp 19-26)

Objectives: To help participants develop decision-making skills.

*Learner Outcomes 6, 10, 11, 13, 14, 15, 16, 18, 20, 21

AGENDA

Session 11 - 4 hours — Energy Simulation - Computer Application

Objectives: To make participants aware of the impending perils of energy misuse.

*Learner Outcomes 6, 7, 12, 14, 17

Session 111 - 2 hours — Lesson Development - Teachers Plan a Unit for Students/Post Testing

Objectives: To prepare participants to implement a unit on environmental education in their own classes.

*Learner Outcomes 5, 7

*See Learner Outcomes following AGENDA

LEARNER OUTCOMES*

1. Given a series of objects, the learner will describe the objects in terms of the information gathered through use of the various senses.

2. Given a situation about which specific information is needed, the learner will devise questions to obtain that information.

3. Given problems to solve, the learner will show a growing capacity to use increasingly abstract media as a source of information as questions.

4. Given problems to solve, the learner will demonstrate a growing capacity to use media that contain an increasingly larger number of variables.

5. Given increasingly complex tasks the learner will demonstrate a growing capacity to select and use the appropriate media.

6. Given two or more similar situations (two children, two families), the learner will compare their attributes.

7. Given a specific situation (technology, people, environment), the learner will note changes over a given time period.

8. Given information (a set of pictures, tools), the learner will group and label the information based on noted similarities and differences.

9. Given a specific set of information, the learner will arrange the items along a continuum (situations from most to least information, historical events by time, etc.).

10. After being presented with information, the learner will identify both facts and inferences and distinguish facts from inferences that are based on facts.

11. Given a situation, the learner will generate logical inferences and identify evidence on which inferences are based.

12. Given information on a topic, the learner will formulate hypotheses on the basis of the evidence presented.

13. Given a situation (such as conflict between groups), the learners will describe their feelings as imaginary participants in the situation.

14. Given a situation requiring a choice, the learner will explore alternatives and make a choice on the basis of criteria that he can defend.

15. Given a problem situation, the learner will recognize the existence of varying perspectives by those concerned with the problem.

16. Given examples of diverse situations, the learner will defend or promote desirable differences and condemn or reduce undesirable differences.

17. Given a list of things, situations, etc., the learner will select those that are examples of inevitable and natural change.

18. Given a problem situation in the school or community, the learner will promote desirable change and condemn undesirable change.

19. Given two different situations affected by a similar change, the learner will compare the ramification of each.

20. In discussing a specific conflict, the learner will suggest alternative ways of settling conflict.

21. After discussing the alternative ways of settling a dispute, the learner will compare the positive and negative aspects of each.

Environmental Education Is _____ iT*

*IT

The symbol "IT" was selected for this program because 1) "IT" is a simple two-letter word representing a thing of unknown complexity, and 2) "IT" stands for individual technology - that quality within one which makes it possible to comprehend the complex changes of the world around you.

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